

In This Issue—*The Chicago Show*

# MOTOR AGE

Vol. XLIII  
Number 5

PUBLISHED WEEKLY AT THE MALLERS BUILDING  
CHICAGO, FEBRUARY 1, 1923

Thirty-five Cents a Copy  
Three Dollars a Year



## Smaller Investment To Carry Complete Champion Line

The dealer can now carry a complete assortment of dependable Champion Spark Plugs, and make a greater profit, with a much smaller investment.

The Champion Blue Box Line now consists of seven numbers, which cover the requirements of all engines produced in quantity. Ford cars, trucks and tractors perform better with Champion X and Champion X long.

The dealers can stock all the numbers with the positive assurance of a quicker turnover and a greater profit than his spark plug department has ever yielded before.

**Champion Spark Plug Company, Toledo, Ohio**

Champion Spark Plug Company of Canada, Ltd., Windsor, Ont.

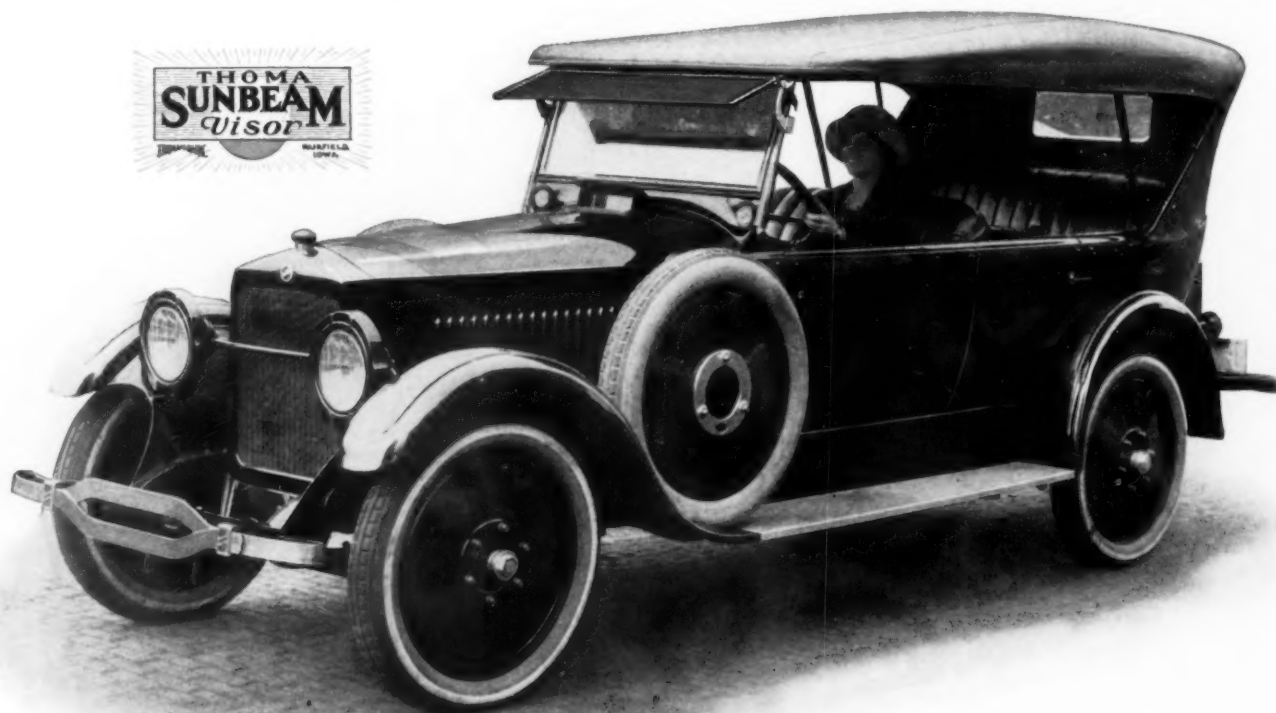
*The Scientifically Developed New Core—Identified by the Double Rib—Is the Difference That Makes Champion a Better Spark Plug*

# CHAMPION

*Dependable for Every Engine*

*Champion X is the one spark plug recognized as the standard for Ford cars, trucks and tractors. Millions are in daily use. They are a sure profit maker for you.*





## Thoma Sunbeam Visor—Made for Every Car—Your Customers Demand



THE THOMA SUNBEAM VISOR is made for every car—open or closed models—made out of the highest quality visor materials, neat in design, strong in construction and adds greatly to the appearance of any car.

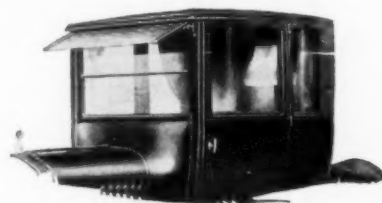
The "SUNBEAM" is furnished in Royal Purple and Green VITROLITE—a material that has made it possible to perfect a Visor that the car owner is demanding. "VITROLITE" is much stronger than glass, more beautiful and absolutely prevents strong light from shining through into the driver's eyes—a feature not to be had in a transparent glass Visor.

The "SUNBEAM" is also furnished in the regular Thoma Process  $\frac{1}{4}$ " Green and Amber Ribbed Glass, making the

"SUNBEAM" line one that meets every demand. Prices on complete Sunbeam Visor line together with dealer's discounts will be mailed on request.

### Sunbeam Junior For All Ford Models

The SUNBEAM JUNIOR is a "THOMA" quality visor made strictly for Ford Open and Closed models. It is furnished only in Thoma Process  $\frac{1}{4}$ " Green and Amber Ribbed Glass. The SUNBEAM JUNIOR is one of the best accessories that a Ford owner can buy and is a Visor that makes a Ford car complete—dealers who are handling the Sunbeam Junior are enthusiastic and say it is their fastest selling auto accessory. Price—\$8.00; West of Rockies—\$10.00.



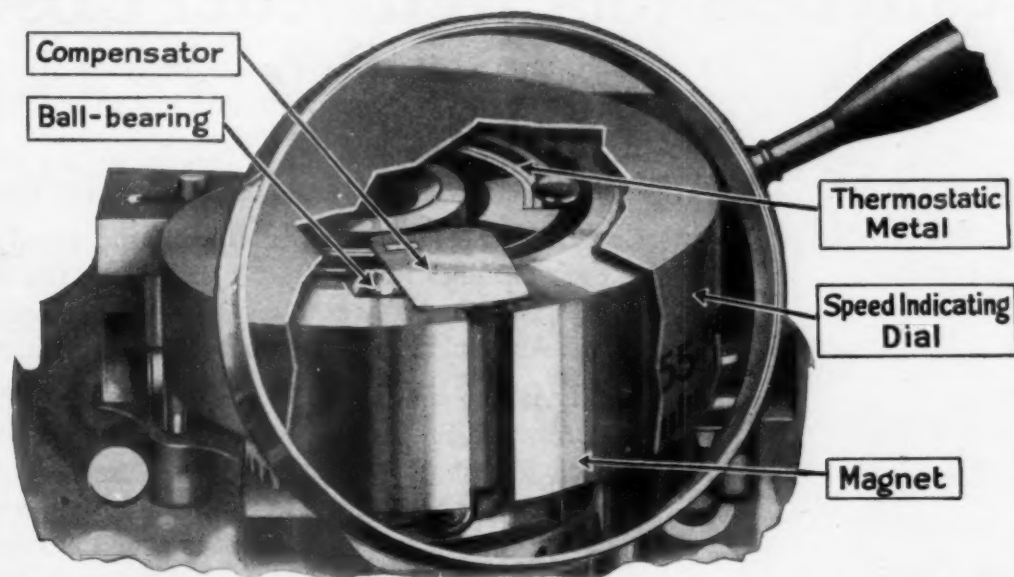
Sunbeam Junior Visor For All Model Fords

MANUFACTURED BY

**THOMA & SON, INC.**  
Everything in  
Glass for the Automobile

FAIRFIELD, IOWA





## New Ball-Bearing Compensator in Stewart Speedometers

INSURES ACCURATE SPEED AT ANY TEMPERATURE

Stewart and Warner Speedometers operate on the time-proven magnetic principle. A magnet is set inside a cup-like device called the speed dial on which the mileage numerals are printed. The magnet is rotated by the drive shaft, and as it turns, its magnetic properties cause the speed dial to follow slowly after it up to a certain point. The faster the magnet rotates the further around the speed dial will follow it. The numbers on this dial, as they appear through the opening in the speedometer face, indicate the correct speed.

It so happens, however, that in hot weather the magnetic attraction between magnet and speed dial is less than in cold weather, and makes a difference in the speed indication unless some means is taken to offset it. In other words, it must be compensated.

This compensating device is a small strip of metal which lies over the gap in the magnet. In hot weather this compensator is thermostatically operated so that

it moves over and opens up the gap at the top of the magnet, thereby increasing the magnetic attraction and retaining the absolute accuracy in speed indication.

### What is meant by Ball-Bearing Compensator

The successful operation of the compensator and the accuracy of speed indication depends upon the freedom with which this strip of metal moves over the gap in the magnet as the weather changes.

That there may be no possibility of this metal strip sticking in its operation, a ball-bearing is placed in a small aperture over which the metal strip moves smoothly and easily, with no possibility of sticking and causing a variance in speed register.

In the most intense heat or in freezing temperature, Stewart and Warner Speedometers register speed steadily and with absolute accuracy from the first turn of the wheel.

STEWART-WARNER SPEEDOMETER CORPORATION  
CHICAGO, U. S. A.

*Stewart*

CUSTOMBILT ACCESSORIES

USED ON 8 MILLION CARS

## "If we can't beat this, we'd better close out"

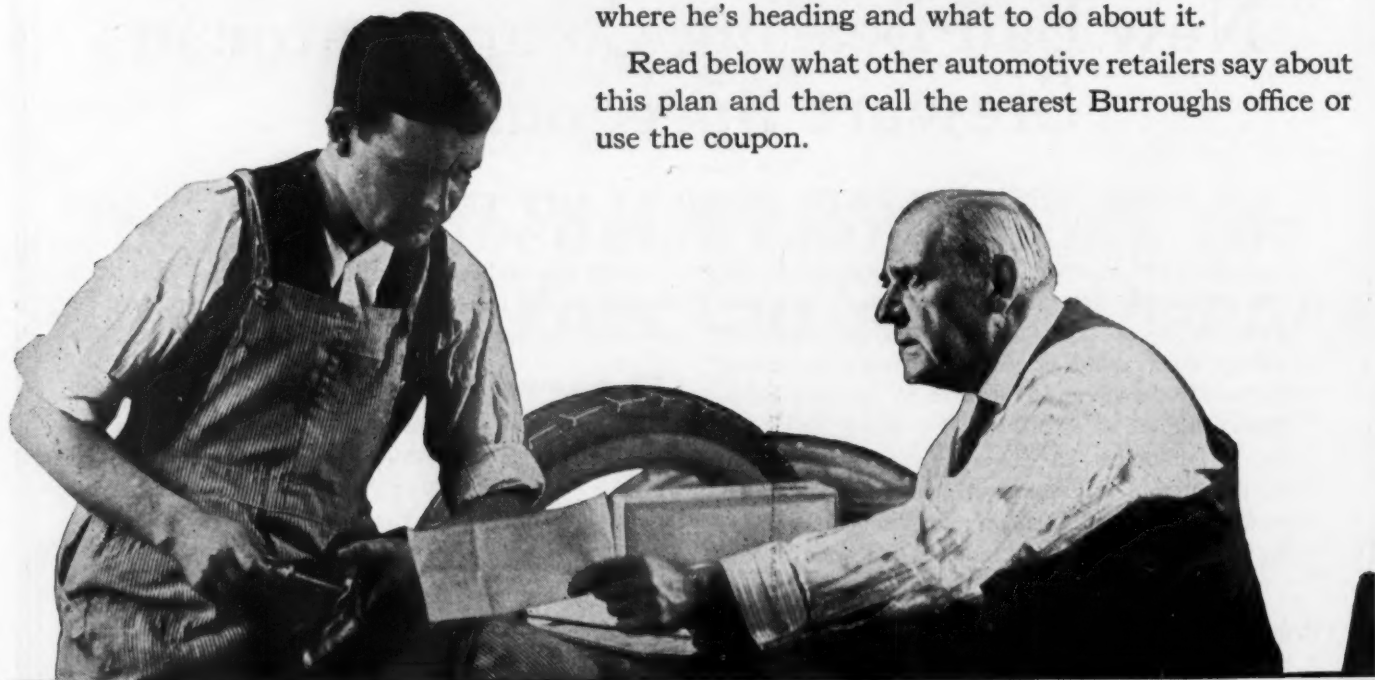
Many a dealer or garage man has felt like saying that—when he saw what was left in the bank after a year's hard work.

What's worse, thousands *do* close out every year.

But thousands of others have found a real remedy for their troubles in the daily figure facts, the daily warnings, and the daily helpfulness of the Burroughs Simplified Accounting Plan for Garages and Dealers.

It is the simplest and most practical system of accounts for the automotive retailer. In a few minutes each day it gives him a complete record of his sales, purchases and expenses by lines and departments and every other figure-fact he needs for intelligent, profitable control of his business. He knows how he stands, where he's heading and what to do about it.

Read below what other automotive retailers say about this plan and then call the nearest Burroughs office or use the coupon.



BETTER FIGURES *for* BIGGER PROFITS

# Burroughs

ADDING • BOOKKEEPING • BILLING • CALCULATING MACHINES

H. A. Geise, Car Dealer, Quincy, Ill.—  
"It has been a great relief to us to see how quickly our work is kept up and the absolute daily check we have with the Burroughs Simplified Accounting Plan."

Weihaup-Savage Co., Inc., Car and Truck Dealer, La Crosse, Wisc.—"We know

at all times just what we are doing, and at the end of each month we are able to get a complete profit and loss statement. A big point is the small expense and little time it takes to operate the Burroughs Plan. To get the same results otherwise would require an expert bookkeeper and at least twice the time."

Burroughs Adding Machine Co.,  
6011 Second Blvd., Detroit, Mich.

Please send me more information about the Burroughs Simplified Accounting Plan for garages.

☐ Garage ☐ Car Dealer ☐ Accessories Store

Name.....

Address.....



# MOTOR AGE

Published Every Thursday by  
**THE CLASS JOURNAL COMPANY**  
 MALLERS BUILDING  
 59 East Madison Street,  
 CHICAGO, ILLINOIS, U. S. A.

Vol. XLIII Chicago, February 1, 1923 No. 5

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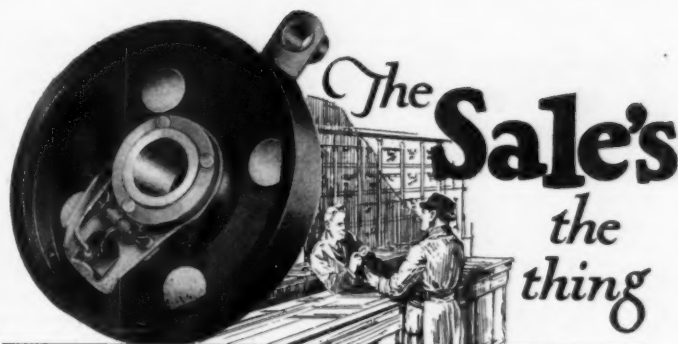
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SUBSCRIPTION RATES	
United States, Mexico and U. S. Possessions.....	\$ 3.00 per year
Canada .....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies .....	35 cents

Subscriptions accepted only from the Automotive Trade

Entered as Second Class Matter Ser 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.



## A Good Timer Means - - - Quick Sales - - - Rapid Turnover - - - Prolonged Satisfaction

A NY timer that can give long, uninterrupted service—that doesn't miss, leak or wear fast—that gives perfect electrical contact at the right moment, at all speeds, permanently—is a GOOD timer.

That's what the Bell Timer does—and that's why it sells fast. It's a step ahead, because it is made right.

The case is made from Bakelite: dustproof, waterproof, leakproof. Contact is copper to copper—reducing wear to a new low minimum. The self-adjusting contact shoe on the rotor is so constructed that it *must* maintain an even pressure against the raceway—compensating for all irregularities of cam shaft motion.

An accurately timed, economically operated motor is assured. Our descriptive data gives the details.

Every dealer and jobber will be interested in our special trade offer. Full information on request.

**BELL MANUFACTURING CO.**  
 Boston, Mass.

**List Price \$3.**

Dealers who handle the Bell Timer are allotted this particularly striking display stand—enabling patrons to inspect Bell construction, showing them the wiping motion of the rotor brush on the raceway contacts and permitting close examination of the other features.



## The BELL Timer





*Stage Whisper:*

## "I Want to Make You a Confidential Offer—"

ONCE there was a Big Boy who batted high in the Bull League. His goods were not-so-good, but his "Line" was the Eel's Elbow.

His Big Winner was the "Confidential" offer, put up in a Low Voice, like he was tipping you off to a gold strike. With the offer went some smooth Oil to the effect that he had picked your House as the livest in town and the One Logical Outlet for his goods.

This Bunk went over often enough to keep the Big Boy eating regularly. But most of the trade suspected that he wouldn't have to make "Confidential" offers if there were General Demand for his goods.

*Moral: "Deals" and "Offers" are Poor  
Substitutes for Demand and Turn-Over.*

**MILWAUKEE MOTOR PRODUCTS, Inc.**  
Milwaukee, Wis.

(Timer Builders for over 18 Years)

National advertising and  
famous quality keep the  
Milwaukee Timer \$2.00  
in demand at  
(\$2.75 in Canada)



# MILWAUKEE TIMER *for* FORDS



## *The* Publisher's Service Station

*Rendering Service to Help You Render Service*



### *The Chicago Show*

The Chicago Show is now open to the public. In this week's number we have endeavored to tell the readers of MOTOR AGE as much as possible about the opening day as it is not possible at this time to go further into the show affairs for the week.

The complete account of the Show will come next week. Then the editors will endeavor to complete the story, telling you as much as possible of the spirit of the show, what it means to the industry and the lesson that goes from this show to dealers everywhere. Even those who attend the show, do not have the opportunity to personally study all of the points of the show, that the MOTOR AGE staff can reach during the week, nor does the business visitor like to stop at all times and make notes of the things that he wants to remember. Our editorial observers will do this for you.

There is much for the dealer in the news from the national shows and while the big news came from the New York Show, the Chicago Show is always important from a dealer viewpoint. In fact, the Chicago Show is very much of a dealer show. Coming, as it does, a month nearer the buying season than the New York Show, it has a more intimate story to tell the dealer of the attitude of the public toward the new goods that have been subject of discussion for the past month.

Next week's MOTOR AGE will be one of the most helpful numbers of the entire year for those dealers who are seeking to get into step with the industry.

Then there's more coming too. Here's just a hint of the good things that make up the late winter program for MOTOR AGE: We have been working on a continuation of the articles on MAKING MAINTENANCE PAY and these will appear in early numbers.

Those of you who have been reading MOTOR AGE for the past two years will remember "Bill Fixit". We are going to resume this character study from an entirely new electrical angle. This new series promises to be more interesting than the previous "Bill Fixit" stories and, we are sure, will tell you of many facts in an easily-read and understandable way.



# A Strong Company and a Strong Line

Both from the standpoint of its financial resources and from the standpoint of its product the Nash Motors Company is one of the great institutions in the industry.

The man who can secure a Nash dealer franchise places himself at once in a most advantageous position to build up a business that will be both profitable and permanent.

The complete new line of Nash Fours and Sixes is meeting with a wonderful reception at the various Motor Shows throughout the country.

Along with the new models Nash also enters 1923 with increased financial strength. The latest financial statement picturing the condition of the company at close of the fiscal year November 30, 1922, shows assets of \$34,551,357.57.

There is no bonded indebtedness and only \$2,586,970.58 of current accounts payable.

A few good territories are available. Get in touch with the sales department at once.

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# NASH

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THE NASH MOTORS COMPANY  
KENOSHA, WISCONSIN

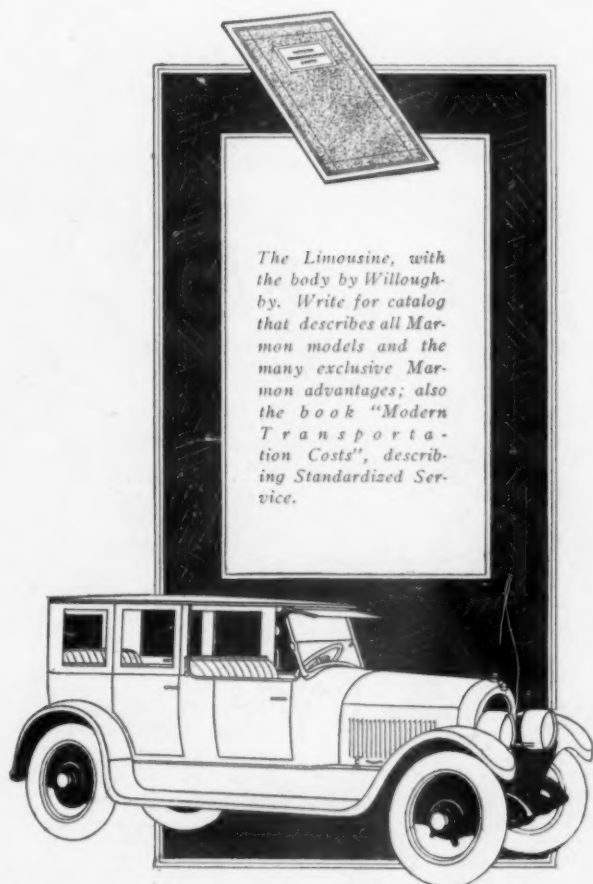
*Nash Leads the World in Motor Car Value*

(1168)



## *If you were a Marmon Dealer—*

—the combination of fine car performance with low cost of upkeep would prove a tremendous selling asset.



You would find it much easier to sell the Marmon than to have to compete against a monthly maintenance average of \$4.71 per car.

In appealing to thrift instead of extravagance, you would gain a far wider audience than would competing fine car dealers.

A reading of the booklet, "How To Shop At The Show," will explain why Marmon is universally acclaimed The Foremost Fine Car—and why you ought to sell it.

A copy will be mailed free on request. Write for it today.

NORDYKE & MARMON COMPANY

Established 1851

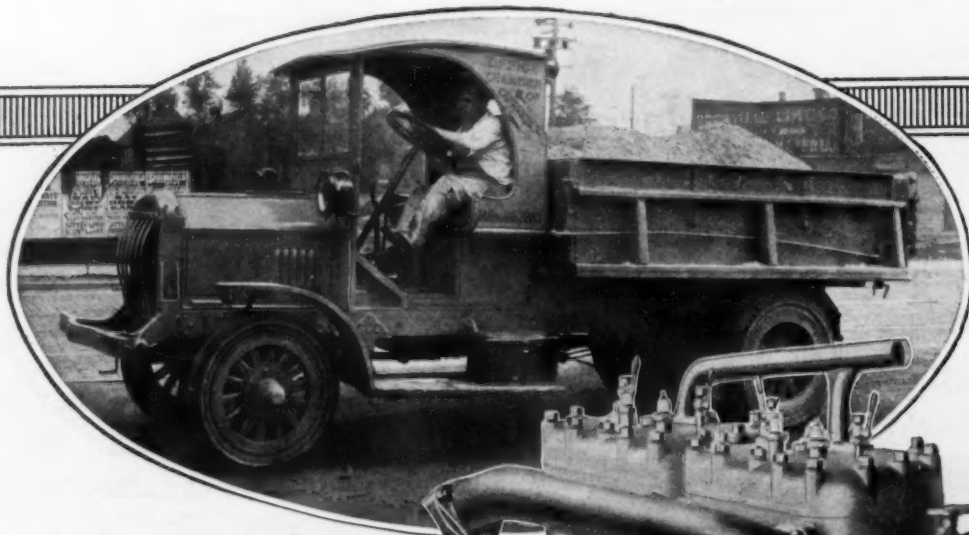
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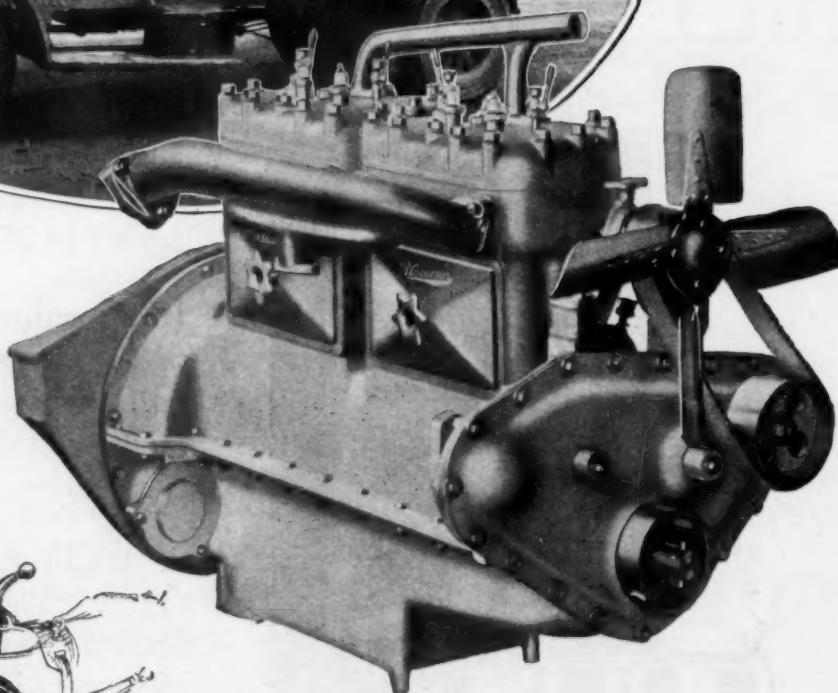
# MARMON

*The Foremost Fine Car*

This is the thirtieth of a series of fifty-two advertisements appearing in this publication



*Wisconsin Motor Model VAU in  
Model C Old Reliable Truck*



*Offices in  
New York, Cleveland,  
Chicago, Los Angeles  
Seattle.*

## Horse Power Is What Counts!

The power plant is the heart of a motor vehicle, and here is a power plant, every line of which spells horsepower—that will stand up to rough work, mile after mile, and year after year.

If you're selling Wisconsin-motored cars or trucks, you can raise the hood and let the buyer see for himself the strong, compact, sturdy construction.

Wisconsin weighs less per horsepower; consequently goes farther per gallon, and lasts longer.

Wisconsin motors are built in a plant designed for production and service. Their construction is standard. They are made in fours and sixes. They are the choice of the best truck, tractor and passenger car makers.

**WISCONSIN MOTOR MFG. CO.**  
MILWAUKEE, WISCONSIN

**Wisconsin**  
CONSISTENT

FEB -5 1923

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Vol. XLIII, No. 5

Chicago, February 1, 1923

\$3 Per Year

# MOTOR AGE



*The Coliseum, at the Opening of the twenty-third Annual Automobile Show*

## Buying Starts Early at Chicago Show

*Many Interested Prospects Among First Comers—Attendance Starts Well and Outlook for Week Is Cheerful*

By CLYDE JENNINGS

**B**UYING interest was manifest from the moment the doors opened for the twenty-third annual Chicago automobile show. Chicago dealers and their salesmen who were on the floor to meet the first comers reported that the large early attendance quickly penetrated to the innermost parts of the exhibits and began asking questions about particular models.

Two sales were reported to Manager Sam A. Miles within a few minutes of the opening. One of these sales was of an electric car.

This same interest was manifest throughout the first

day and it was taken as an indication that this was to be a great buying show. The Chicago dealers who were supplying the salesmen for the exhibits were quite enthusiastic over the prospects. Several of the dealers who thought they had adequately manned their exhibits were compelled to send for more salesmen before the show was two hours old. Throughout the afternoon and evening the salesmen on duty were kept busy.

The opening was a success in spite of bad weather. There was a wet snow falling that turned into rain by evening and the walks were covered with slush. How-





*The Armory held the overflow of exhibits which could not be accommodated in the Coliseum*

ever, the crowd braved the weather and the opening appeared to be better than in New York.

The dullness of the day outside rather emphasized the brightness of the decorations. Both the Coliseum and the Armory were liberally decorated, the colors were bright and the scheme interesting. The numerous lamps were unshaded and the effect at all times was rather that of walking from the gloom of evening into daylight. The car exhibits were all in place when the show opened. A few accessory exhibits were not in place and in some places the packing cases had not been removed, but the show was ready to rather a remarkable degree.

As was to be expected, there were not many factory officials at the show or in town on Saturday. The hotels did not present a jam at all, but inquiries usually revealed that the factory delegation would be here on Monday. In this there was a difference from New York, as there always is. The factory folk are rather anxious to know how things start in New York, but once the show season is on they lose this anxiety as they believe that people are pretty much the same in various sections of the country.

#### **"Pep" Meeting Starts Activities**

The show activities really began on Friday night when the Chicago dealers gathered their salesmen at Orchestra Hall for a "pep up" meeting. C. F. Kettering of the General Motors Research Corp. was the chief speaker at this meeting and he interested his audience in a story of the development of the automotive vehicle and its future that serves an excellent background for a salesman's work. The direct message at this meeting was the basis on which salesmen in the exhibits were to be judged during the week.

It was explained that there would be inspectors going about during the week and talking to the salesmen in the guise of prospects. The objective was to make the salesmen attentive and courteous at all times, and to stop knocking. Prizes are offered, for each day.

The evidence of this training was apparent on the floor. In the main, the salesmen were at the front of the booths, they were greeting people politely and not showing an over-aggressiveness in attempting to obtain the name of every person who stopped. Very few instances of salesmen enjoying themselves at the expense of the public were observed, but several instances of "knocking" were heard. It appears to be impos-

sible to train a group of men to believe that it is not necessary to destroy the other fellow to make good on his own product.

This show was not remarkable for the new products shown, nor for the price changes or news of that sort. Several cars not shown at New York were in evidence. The Yellow Cab Mfg. Co. exhibited the Ambassador, and explained that this car was being made up to order and that one order was taken that afternoon. Only enclosed jobs were being offered.

The Climber, the Little Rock car, was back in the show, and the exhibit was featured by a roadster. The Lexington had a new model roadster, called the Skylark. Otherwise, the cars shown were very much the same as at New York. A few of the bad taste paint jobs shown in the previous show were missing, probably having been done over. Franklin served one of the surprises of the show in a brilliant yellow enclosed car.

Price changes, which are given in detail elsewhere, were not startling. A few dollars up and down on particular models practically took care of these changes. There was nothing in this line to disturb the calm of the manufactur-

ers as a whole. In this respect the show was much different from last year.

The interest of the public was manifest in the usual way. As the choice of spaces is given in order of total business at factory price, the heavy production cars are grouped on the main floor of the Coliseum, the next in production interest in the annex, and the lower production in the Armory. It naturally follows that the main crowd is in the main floor of the Coliseum. Here, too, are the best mechanical exhibits.

The stripped chassis, all of them more or less cut-out to show the action of the parts, the engines with sections of walls replaced with glass to show air passage or lubrication, and the other educational devices, are featured most heavily in this section.

Also, it is demonstrated here that there is much more interest in the changes of a well known model than in a little known one. Over in the Armory the cars are much more individual in design, more approach to freakishness, more brilliant color jobs, and in general, many points of interest that would seem to be interesting to the public, but not all of the crowd reaches this part of the show and those who go there do not linger. However, the \$25,000 gold plated town car exhibited by McFarlan always held passers-by. This car is discussed elsewhere.

#### **Many Accessory Exhibits**

There are more accessory and equipment booths in this show than in New York and while they are scattered in balconies, a second floor and a basement, the exhibitors have no complaint for the lack of an audience. A lot of people will go almost anywhere, it seems, to look over the small equipment. There is always the hope of seeing a moving demonstration and some advanced device that the observer can fully understand. Among the exhibits in the basement were a number where tools and other low priced devices were offered for sale to the public "usually at a special introductory show price." In the main, these exhibitors did a very good business.

One notable change in the show arrangement was that the awning that covered the alley that provides the path from the Coliseum to the Armory was missing. Last year there was an accident due to a high wind and this year it was thought best not to repeat this risk, so the people who went from one section of the show to the other braved the weather, but the light rain and snow did not appear to worry them.

There was a continual stream of people going back and forth and the hot dog merchants along the alley reported an excellent business. It seemed too bad that many pools of water were left standing in this alley.

The outside attractions at this show are more numerous than at any other. The space in the show never equals the demand and there are always the auxiliary shows at the hotels. This year the Drake hotel, as usual, houses the showy Salon where cars of five nations are exhibited. This is practically a repetition of the Salon held several weeks ago at the Hotel Commodore in New York and described at that time in MOTOR AGE.

The Elizabethan room at the Congress housed an elaborate exhibit which was featured by the Stutz, Kissel, National and Rickenbacker lines. The Tarkington car, a newcomer from Rockford, Ill., was on private exhibition, as was the Crossland steam car, improved over the design of several years ago.

The Greer show, which adjoins the Coliseum, housed a number of exhibits, and several showrooms on Michigan and Wabash avenues were occupied temporarily by exhibits planned to attract the visiting public. Around the Coliseum, especially at night, were the usual cars advertising special exhibits and novelties. This old-time feature of shows survives to a greater extent than in New York.

One feature that is revived was the line of demonstrators outside the show. Rather, the cars standing at the curb were intended as a means to carry prospects from the show to salesrooms. Several exhibitors who could show only a part of their line in the show had a complete display in the salesroom on Michigan avenue, and when any visitor expressed an interest in any car not in the show he was offered passage to

the salesroom and back. Of course, the ride to the salesroom was a demonstration.

As was to be expected, Norval Hawkins' renunciation of shows, which was published this week, came in for a good deal of discussion, but none of the people gathered in Chicago agreed with Hawkins, although a number of them were inclined to be critical of some features of the show week functions. These criticisms of the show were as to details and really have nothing to do with the big show idea.

The criticisms of show week affairs are generally leveled at the conduct of some dealer meetings and the dealers who discussed this feature agreed with Hawkins that the entertainment at these functions was often grossly overdone. But all of the dealers were strong for the show; as a show, Henry Paulman appeared to express their idea of it in his answer to the questions:

"What are you looking for at this show?"

"Lots of business. We know there is business to be had and we expect to get many leads at this show," was Paulman's answer.

At this writing everything appeared to be set for a big week. There are the meetings of the National Automobile Dealers' Association and the Society of Automotive Engineers which are of special interest to dealers. Also, a long list of company dealer meetings. Other meetings were of interest to the manufacturers and their representatives chiefly. All of the hotels had exhausted their reservations and were turning away applicants for rooms.

And there was no break in the feeling that the industry was certainly set for a very fine half year, with the prospects of the latter half of the year being a very good one.

#### CLOSE ATTENTION TO DETAIL GETS ORDERS AT SHOW

Modern methods are apparent in the retailing efforts in the Coliseum and there is plenty of pep in the work of the salesmen and courtesy and intelligence are the watchwords that are making business for the local dealers whose factories are exhibiting at the present Chicago show. Prospects are receiving every attention, the salesmen are on their toes at all times and in consequence the twenty-third annual exhibition promises to go down into history as a producer of real business.

This smooth running sales machine has not been produced without preliminary effort or thought. It is the result of the experience of last year and attention paid to training the salesmen properly before they went into the show—a drill that was undertaken by the Chicago Automobile Trade Association, which has spent considerable time and money in the effort. The idea was tried out last year and worked so well that it was repeated this time.

The association is further inciting its salesmen to intelligent effort by offering a series of cash prizes, awarded daily, for the best salesman of the day as discovered by secret representatives of the association, who go through the show posing as prospects and reporting back on the treatment they get and on the intelligence displayed by the salesmen in handling prospects.

The association saw to it that the salesmen did not go into the show unprepared. Each dealer has been drilling his own salesmen for some little time and on Friday night the association held a dress rehearsal at which those who were to be in attendance at the show were told of the finer angles of sales-

manship. They were told to take a cheerful view of everything, to discourage talk of bad times or poor business and, above all, not to knock the cars of their business rivals. In other words, they should sell cars by using modern business methods.

Another noticeable thing about the work of the retailers is the return by some to the use of demonstrators. Time was when every exhibitor felt it necessary to maintain several demonstrating cars outside of the show for those prospects who demanded the proof of the pudding and who wanted to ride in the car before making up their minds. This was a popular feature for several years but the practice finally was abandoned because of the expense and not work, not to overlook the fact that it no longer

was necessary to prove to the buyer that the car would actually run.

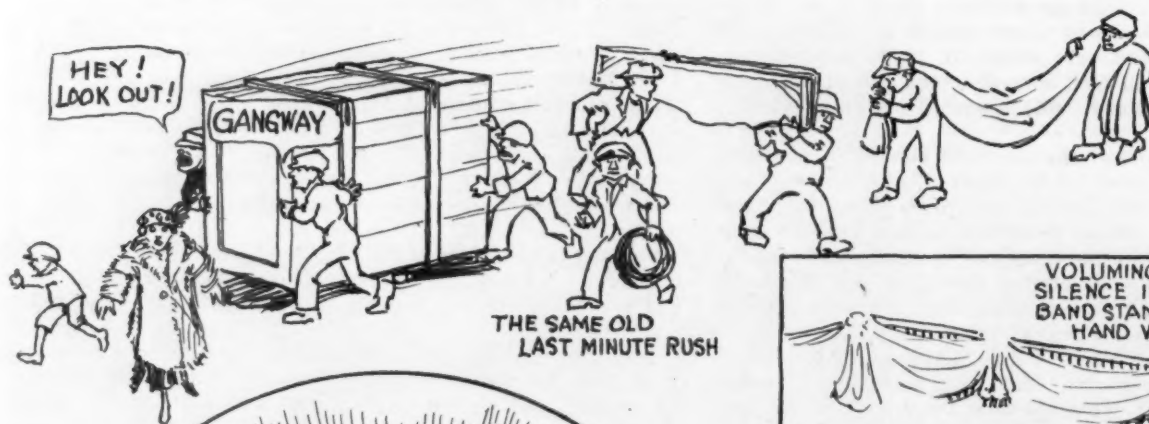
Now, however, there seems to be a return to the practice on the part of a few who believe that a demonstrating ride, short though it may be, adds the final touch which gets the name on the dotted line. Studebaker is one that is trying it out. Reo is another. Peerless has a shuttle service between the Coliseum and the retail store, made necessary because lack of room will not permit the exhibition of the full Peerless line. A prospect desiring to inspect a model not in the Coliseum finds a Peerless car at the door of the show which carries him to the retail store. Then, if a demonstration of the riding qualities of the car is desired, there is still another demonstrator waiting to finish the job.



One of the features of the Chicago show was a painting showing the ideal section of the Lincoln Highway



# The Same Old Show



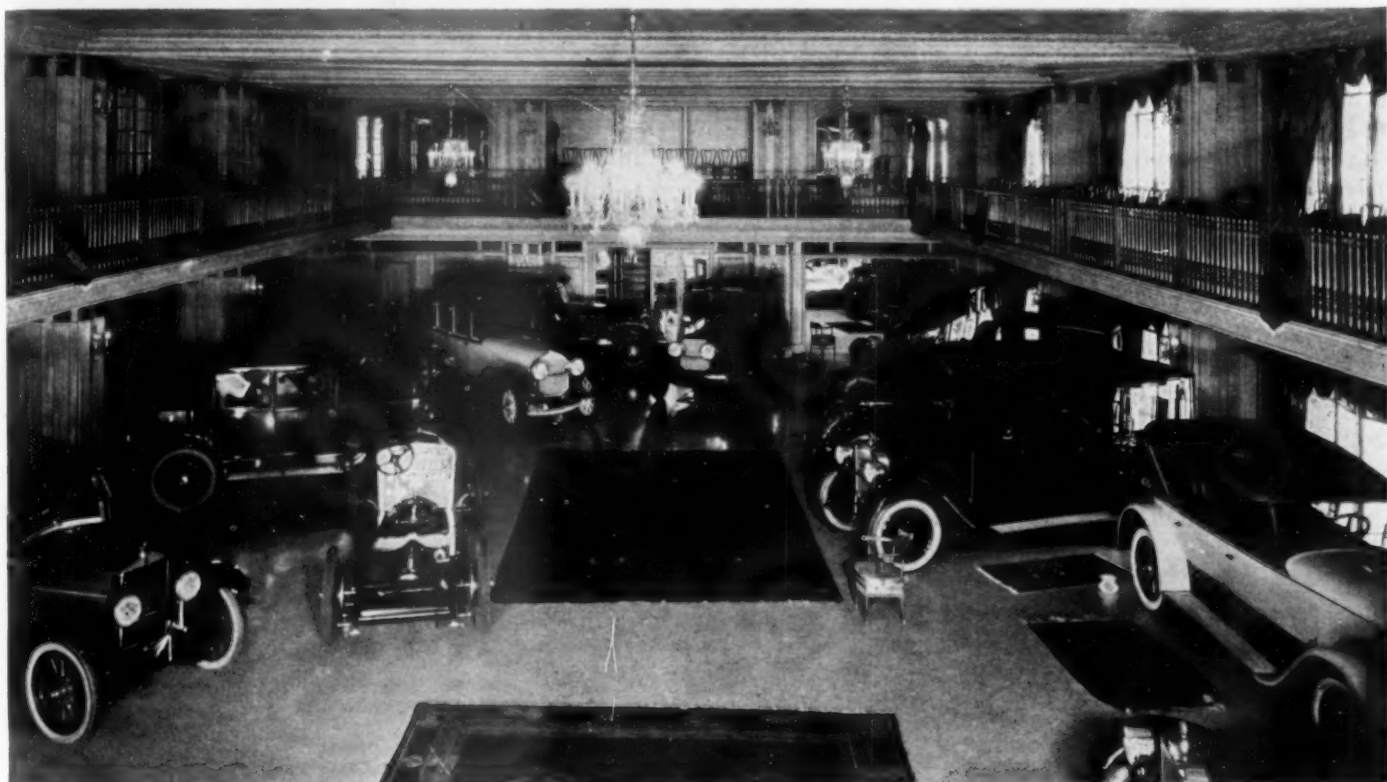
JOE, WHAT'S THEM THINGS?  
ARE THEY SIRENS?





## Custombuilt Coachwork Shown at Annual Chicago Salon

*Finest of Europe and America in High Class Body Jobs and Chassis on Display—Majority of Cars Are Enclosed Types*



*A general view of the Salon held at the Drake Hotel, showing America's and Europe's finest in coachwork*

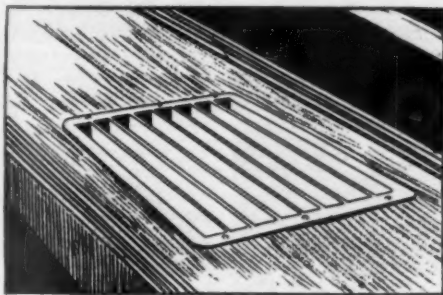
FOUR European countries—England, Belgium, Italy and Germany—are staking their products in the way of fine motor cars with those of the United States at the eighth Chicago Automobile Salon at the Drake Hotel. Altogether, there are 23 enclosed cars, six open models and two chassis on exhibition. Among the foreign cars exhibiting are Rolls-Royce, Minerva Knight, Isotta Fraschini, Benz, and the Itala car.

The American companies include Duesenberg, Daniels, Cunningham, Leon Rubay, Winton, while the bodymakers, such as Kimball, Fleetwood, De Causse and Seaman, are displaying their products on such cars as the Locomobile, LaFayette, Cadillac, Marmon, Packard and others.

One of the most interesting exhibits at the salon this year is the two-passenger town brougham exhibited on a Cadillac chassis by C. P. Kimball & Co. of Chicago. This body is an adaptation of the old horse-drawn brougham. In fact, the

general dimensions of this body have been made almost identical to the horse-drawn brougham, with modifications, of course, to fit it to the chassis of an automobile.

The interior of this car is a beautiful



*Aluminum foot scrapers in the form of a grating are set into the running board of the Isotta seven-passenger touring car shown at the Salon*

example of the coach builder's art. Aside from the novelties, the interior is upholstered in a tan-colored material known as Wulffing cloth, which is imported from Germany, and which is said to not be affected in any way by the action of light or atmospheric conditions. The exterior of the body on this particular car is painted in a tan to match the interior. To accentuate the upholstery the car is tastefully trimmed in mahogany.

Another distinctive body is the seven-passenger on the Isotta chassis. This body has some rather unusual hood and cowl lines which are further emphasized by painting part of the cowl and hood in a different color than the major portion of the body. The car is finished in cream and dark maroon. Upholstery is in heavy leather of a color to match the maroon. Mahogany is used for trim throughout this car, even to the bows in the khaki top.

The running boards on this car also

are rather novel, in that they have a grating type of footscraper just below each door. These scrapers are of aluminum and have nine bars running horizontally. They are open, of course, so that all dirt falls through the runningboard. A little detail of refinement is the fitting of two dome lights in the rear bowl of the top, which is rather unusual in the touring car model.

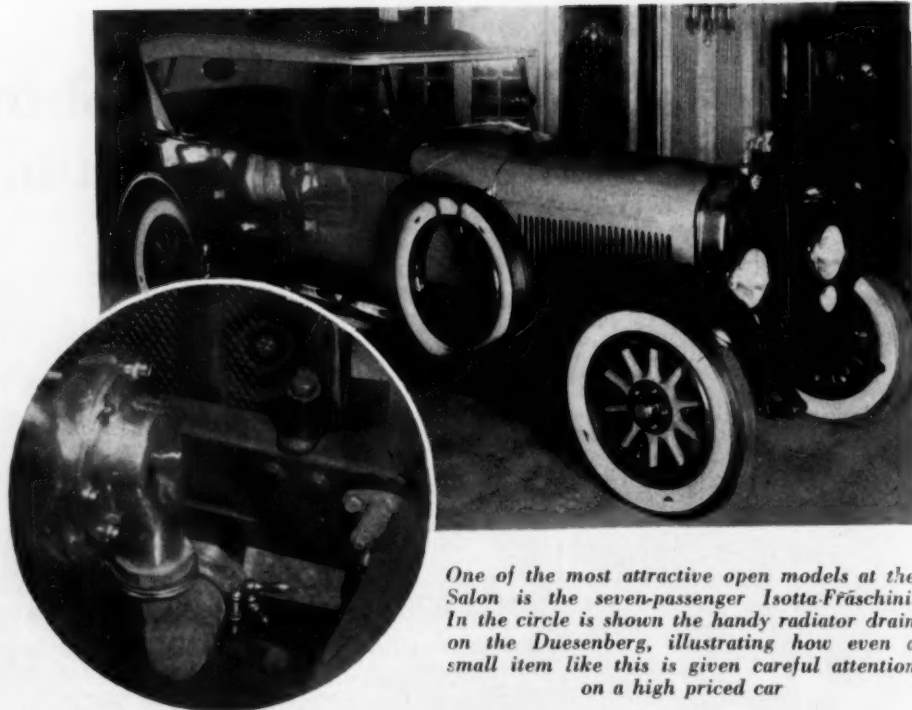
Considerable interest was shown in the exhibit of the Leon Rubay Voitures de Ville, which car has been described in this paper before. It is the first time it was shown in Chicago and its many novel features, including an overhead-camshaft engine, four-wheel brakes, wooden runningboards, finished natural, and aluminum instrument board with all the instruments under one glass attracted much attention.

In addition to displaying a chassis, Duesenberg is showing a sedan with a Fleetwood body. This car is finished in a wine color and carries two spare wire wheels, one on each side of the hood. In addition, Fleetwood is showing two town car bodies, exhibited on two Lincoln chassis.

Cunningham is showing two enclosed models and two touring models. Both of the latter are fitted with wire wheels and are of the characteristic Cunningham design, in which the runningboards have been replaced by aluminum steps. The enclosed cars are fitted with wood wheels.

Winton has a touring model and enclosed model. Four Locomobiles, all with enclosed bodies, are shown by De-Causse. Daniels has three enclosed cars. Rolls-Royce has two enclosed and one touring, Italia one town car and Minerva Knight one enclosed car. Two cars, the Benz and an additional Isotta, did not arrive in time for the opening of the salon.

This show is entirely a custom show and is put on essentially for those people who want something different and who are not impressed by the regular stock chassis and bodies. Therefore, the body



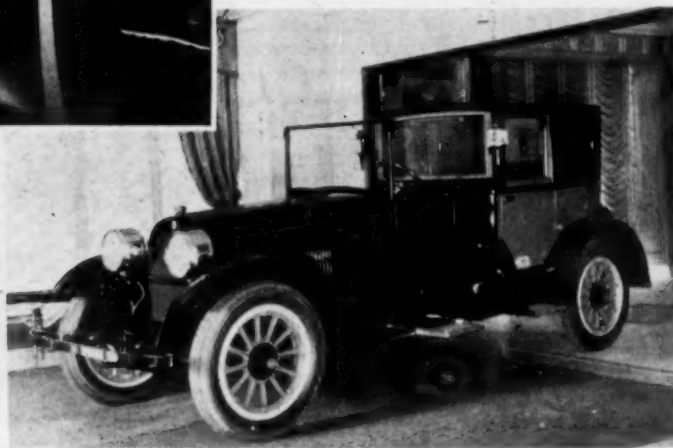
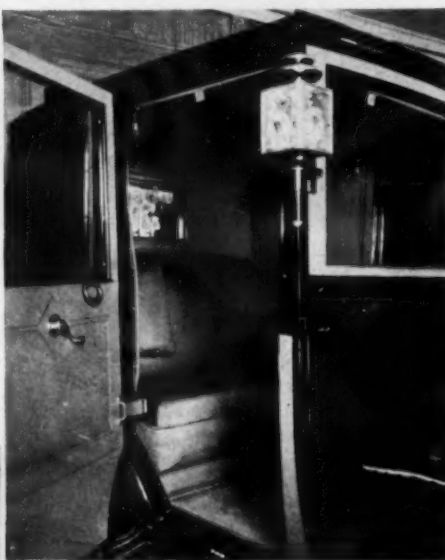
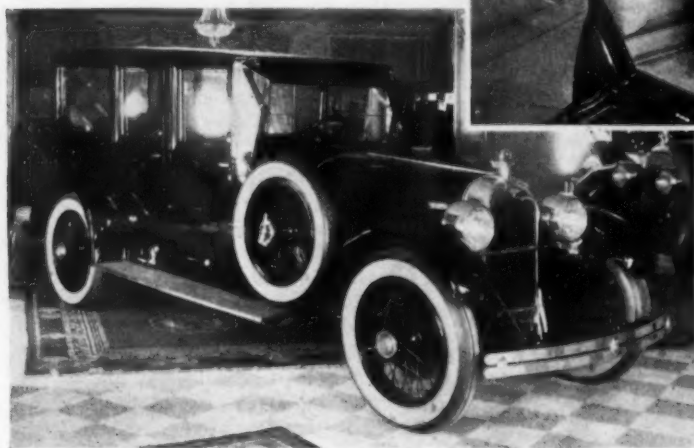
*One of the most attractive open models at the Salon is the seven-passenger Isotta-Franchini. In the circle is shown the handy radiator drain on the Duesenberg, illustrating how even a small item like this is given careful attention on a high priced car*

designs, finishes and trim are carried out in such a manner as to sufficiently remove any semblance to stock practice.

While the cars exhibited at the salon are in a class which appeals essentially to the wealthy, it is a fact that along with excellent design, coach building and

construction, serviceability has not been overlooked. One might expect that a car which is usually driven by a chauffeur and which is not made in any great volume need not necessarily be accessible in such matters as engine and clutch adjustments. Strange to say, this is not the case after one makes a survey of the field. Accessibility, in fact, seems to go hand in hand with good design and high-priced construction.

The salon of this year appears much brighter than last year's affair, due partially, of course, to the light-colored cars and light trimming. The style, so far as the enclosed cars are concerned, seems to dictate a light-colored upholstery cloth, and in order to avoid too great a contrast the exterior is finished usually to match, or perhaps a shade or two darker. Genuine mahogany for interior trim prevails.



*At the lower left is shown the Duesenberg sedan, a wire wheel equipped enclosed car with an unusually roomy body. The other two views are of the town brougham body, built on a Cadillac chassis by Kimball. This is a two passenger body and follows the general design of the old horse-drawn brougham*



## Few Really New Cars at Chicago Show

*Exhibits Largely Repetition of New York Show—Lexington Shows New Roadster—McFarlan Trim-In-Gold Town Car Luxuriously Appointed*

AS might be expected, there were very few really new cars or models at the Chicago show which had not already made their appearance at the New York show two weeks before. Any car maker who has a really new model to "spring" usually does it at the opening of the New York show. Consequently the Chicago show is largely a matter of repetition of what New York has shown, and only in a few isolated cases do makers show products at Chicago which were not at New York.

It often happens that the exhibits Chicago has which New York did not have are those of Western manufacturers whose cars are sold largely in the vicinity where the factory is

located and seldom reach eastern territory with their product.

No really new models were in evidence at Chicago this year, although, of course, the middle west had its first chance to see some of the new 1923 models which made their debut at New York. Lexington has a roadster at Chicago which is new; Climber is showing its phaeton and roadster; there is the \$25,000 McFarlan town car, and at the other extremity we have the Star.

One of the entirely new cars which is not at the show but which is shown in an establishment on Michigan avenue is the Tarkington, a product hailing from Rockford, Ill. This is described in this issue of MOTOR AGE.

### Stutz Shows Six for First Time in Chicago

CHICAGO show-goers had an opportunity to view for the first time the new Stutz six-cylinder models, mostly shown both at the Coliseum and the Congress Hotel. The six-cylinder car is offered in three body styles, phaeton, roadster and sedan, prices being, respectively, \$1995, \$1995 and \$2550.

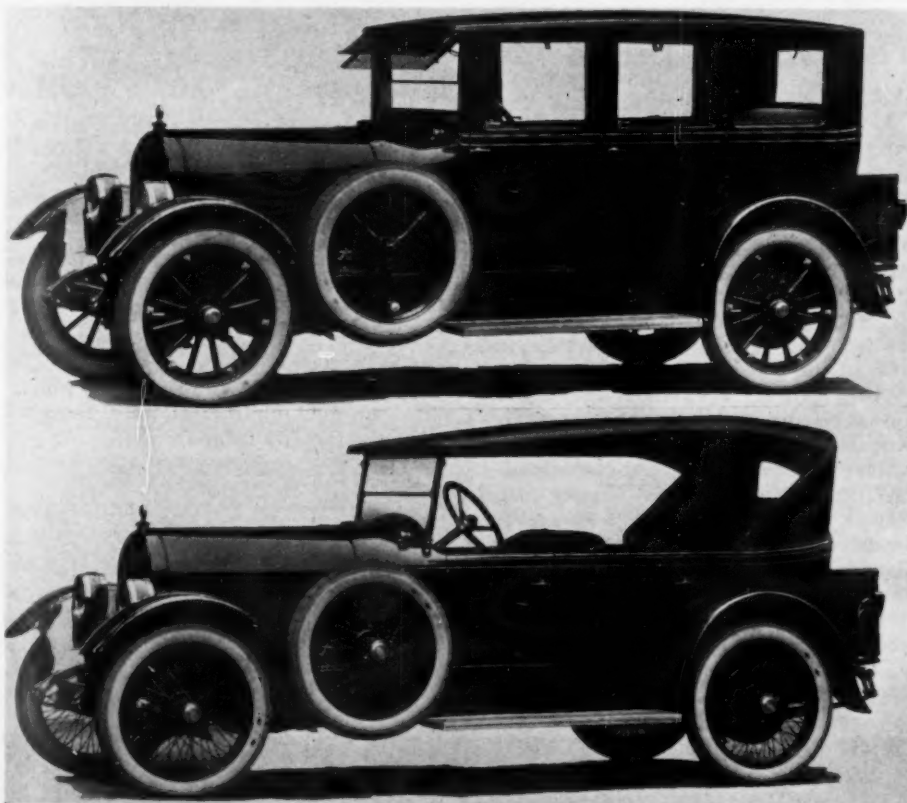
The car is fitted with a six-cylinder overhead valve engine, 3½ by 5 inches. Cylinders are cast in block and the upper half of the crankcase is cast integrally with the cylinders. Remy starting, lighting and ignition is used, while the carburetor is Stromberg. Cooling is by pump. The clutch is a single dry plate type and the gearset is a three-speed unit. The car has a 7-in. frame, which is tapered at the front end to permit of a shorter turning radius.

The rear axle is semi-floating with spiral bevel gears, while the front axle is the conventional I-beam. The service brake is an external contracting type and the emergency internally expanded, both being on the rear wheels. Springs are semi-elliptic, the front being 38 in. and the rear 62 in. Wood wheels are regular equipment, fitted with 32x4-in. tires on the open models and 33x4½ for the sedan. The wheelbase is 120 in.

The phaeton is finished in cobalt blue with black wheels, fenders splashers and radiator. Upholstery is Spanish leather. The top is of the permanent type. Maroon is used to finish the roadster.

The sedan is finished in ultramarine blue with a superstructure in black. The upholstery is in coach cloth.

The complete description of these cars, dwelling particularly on the mechanical features of the chassis, will appear in an early issue of MOTOR AGE.



Here are two pictures showing the touring and sedan models of the new Stutz six-cylinder cars. It will be noted that the body lines incorporate some of the well known Stutz characteristics of former models

### Climber Makes First Appearance at Chicago

ONE of the cars which made its appearance at the Chicago show was the Climber, made by the Climber Motor Corporation, Little Rock, Ark. The company showed two touring cars and one roadster. The price on the touring car has been reduced from \$2250 to \$1695, while the enclosed car is reduced from \$2750 to \$2250. The price of the roadster is \$1095.

While this car has been on the market for some time, this is the first time it

was shown in Chicago. There are no radical changes from last year's car with the exception that some body details have been changed. The doors are slightly wider, upholstery is of better material and the chassis has been refined at several points. This car has 125-in. wheelbase and is fitted with a Herschel-Spillman six-cylinder engine, 3¼x5 in.

The company has adopted the latest type of Bosch magneto for the ignition, while the starting and lighting system is a Westinghouse. From the engine the drive is through a Borg & Beck clutch

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to a Munson gearset and from this to the rear axle in a conventional manner. The rear axle is geared 4.75 to 1. Hotchkiss drive is used for both propulsion of the car and for torque and brake reaction. The springs are semi-elliptic, 24x2 in. front and 52x2 in. rear. They are under-slung from the rear axle.

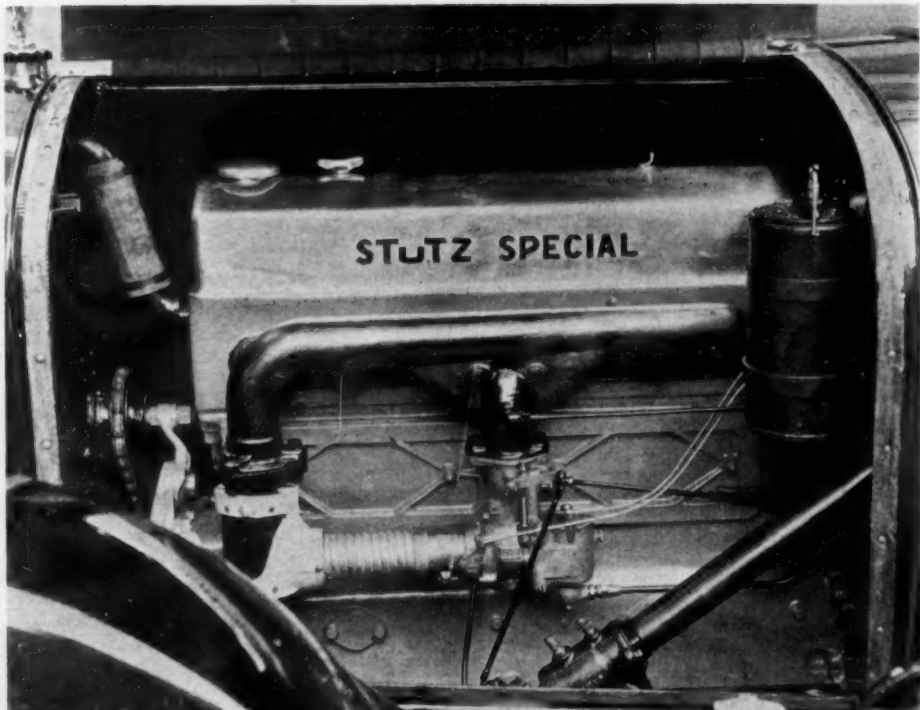
The frame has a depth of 7¾ in. The wheels are of the artillery type and fitted with 32x4½-in. cord tires. The body is of the double-cowled type and finished in optional colors.

One of the cars at the show was fitted with disk wheels having demountable rims. The tire carrier at the rear is made in the form of a disk wheel and to all appearances looks like one. One of the characteristic features of the Climber is said to be the completeness of equipment, which, besides the usual equipment, includes side windshields, engine-driven tire pump, front and rear bumpers, foot-resting tonneau, etc.

### The Highest Priced Car

WHAT is probably the last word in custom-built cars is the McFarlan town car, in which gold plating is the chief feature. This is not merely a show car but has been built to order, it is said, for a wealthy Chicagoan. The price is said to be \$25,000. The application of gold plate has not been confined merely to such details as door handles and probably the unusual feature about the car is the fact that such parts as the rims and hubs of the disc wheels are plated.

Gold plate is used from one end of the car to the other, and while there are probably several hundred points on the car thus finished, the plating is confined really to about 30 major items. These include the radiator shell, motometer, headlamps, spotlights, dashlamps, sidelamps, taillight, the windshield frame, the cowl head, fender mirrors, shock absorber fittings, bumper fittings, rims on wheels, hubs, hood fittings, steps, bezels of instruments on instrument board, windshield cleaner, door handles, all in-



Left side of the Stutz engine. The intake manifold is of the hot-spot type. Note the Alemite connections on the steering gear housing

side trim, trunk bars, rear curtain lights, top stanchions, gearset lever, accelerator pedal, floorboard mountings, and the gasoline tank cap.

The car itself follows the usual McFarlan construction and is finished in a very dark color, a bluish black which, with the gold plating, offers a remarkable contrast in color.

### DISTRIBUTORS SEE GOOD BUSINESS PROSPECTS AS SHOW OPENS

The opening of the Chicago show found distributors and factory men in a happy mood—everyone expressed views of confidence in what 1923 holds forth to the industry. A lively attendance on the first day proved that the public is more

than interested in "what is new" and "what is the price"—these being the first questions asked of salesmen.

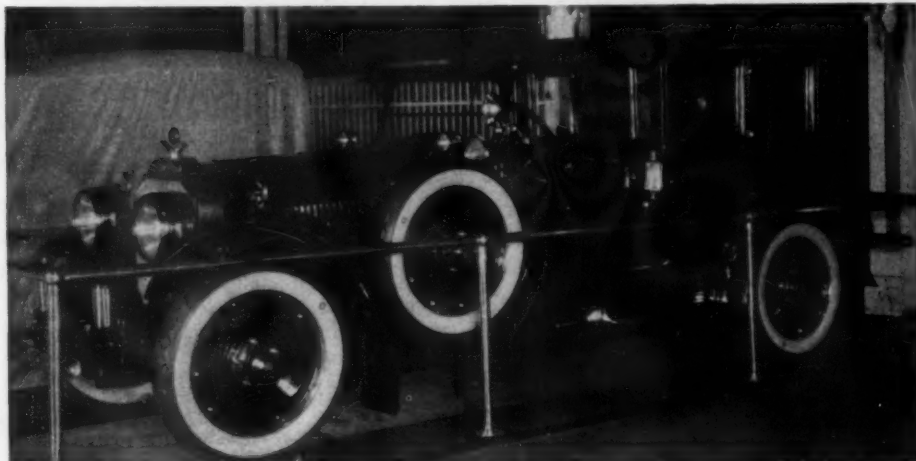
A good representation of dealers was present for the opening and some of the distributors were bent on enlarging that part of their organizations before the end of the week. H. H. Kamp, Davis distributor for Chicago territory, was especially optimistic. "We have signed several new dealers within the last few weeks," he said, "and there can be no doubt that 1923 is going to go down as one of the biggest, if not the biggest year, in the industry. At least in our case, every indication points to a banner year."

A. F. Schultz, vice-president and general manager of the Stearns-Knight, said, "The announcement of our new model some time ago has enlivened things quite noticeably for us. January has started out with sales and production pointing to a prosperous year and I believe that it is going to be just a starter compared with any previous show month."

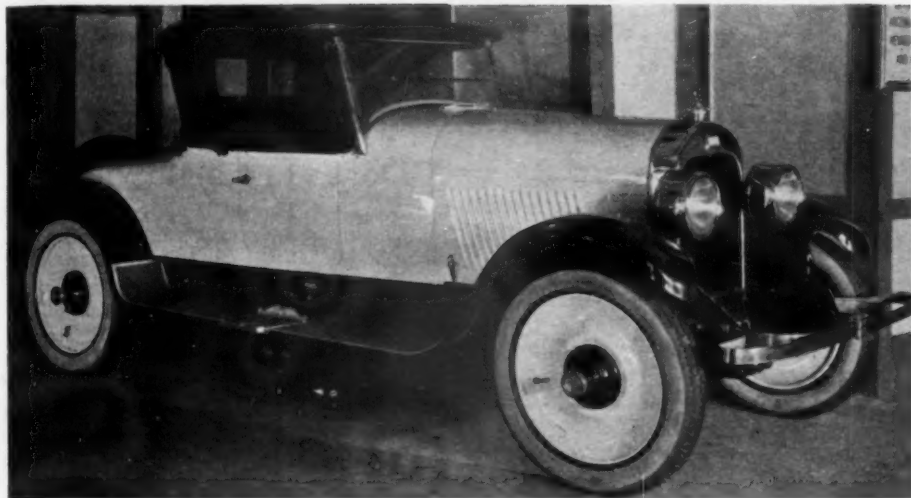
Herald O. Doyle, factory sales representative of the Columbia Motors, spoke of the atmospheric change in the New York and Chicago shows, comparing the decorative efforts of both and the brand of salesmanship shown. While it was still early in the week for any kind of a definite statement as to attendance and sales, Doyle asserted that by Thursday "they would be locking them out."

E. H. Gilcrest, vice-president and general sales manager of Westcott, predicted greater selling effort on the part of dealers, who, he said, would find in 1923 an incentive to make the new year even greater.

F. D. Cerf, general manager of the



Here is shown the most expensive car at the Chicago show, the McFarlan town car, which was lavishly equipped with gold-plated parts, such as radiator shell, hubs, door handles and interior trim



The new roadster which Lexington showed for the first time at Chicago. It exemplifies the completely equipped car

Stutz Chicago Co., got away to an early start when a photographer for one of the daily papers and Horace Wade, celebrated 11-year-old boy reporter, shot a picture of the Stutz sport model with the youngster perched on the hood. Cerf declared that 1923 would be the greatest year in Stutz production and sales.

Accessory and equipment exhibits in the basement and gallery had crowds of interested spectators at their booths from the opening hour until close. For the bad weather which marked the first day, attendance might be said to have been exceptional.

### Pilot Has Model Rear Spring Suspension

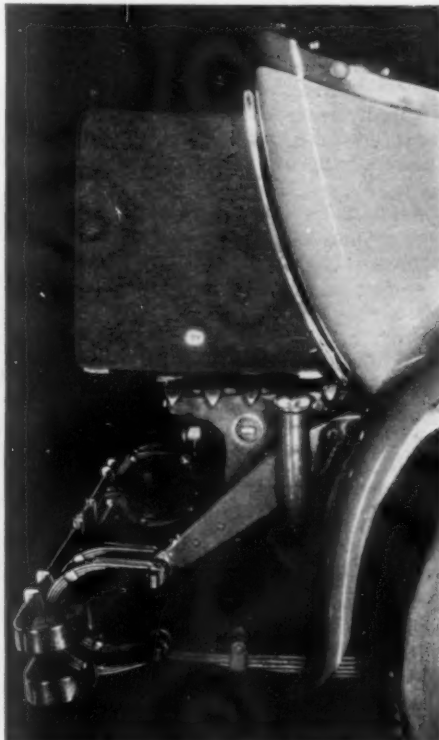
ONE of the rather unusual mechanical constructions noted at the Chicago show opening is the method used by Pilot in supporting the rear end of the rear springs from the frame and mounting the bumper. Instead of using the usual shackles at this point, the company hangs the spring from the frame by two C-springs which are made up in laminated form, very much after the same pattern of the conventional semi-elliptic springs, with the exception, of course, that they are bent into almost a complete circle. The bumper is mounted directly on the thickest part of these springs.

Incidentally, this car is an excellent example of accessibility when it comes to the gasoline tank filler neck. The neck is brought to the outside of the frame in a perpendicular position and is sufficiently removed from the body and frame structure to enable a filling station attendant to insert the gasoline hose nozzle without difficulty or marring the body. A gage placed in the side of the tank also is much easier to read than the type placed in the center of the tank and often obstructed by a touring trunk.

### Lexington Skylark Speedster

THE Skylark model Lexington exemplifies the completely equipped car. It is a two-passenger speedster selling for \$1795 f. o. b. factory, Connersville, Ind., and makes its first appearance at the Chicago show.

Power and speed, long recognized as characteristic of the Ansted engine, are emphasized by the lines of this snappy car. Bumpers on this model are not accessories to be purchased after the car is delivered but are as much a part of the car as the fenders. Wheels are of the disk type, with wire wheels optional, five being included as regular equipment.



The novel method used by Pilot in hanging the rear springs. C-springs are used in place of shackles and the bumper is mounted to the C-springs

The spare wheel is also supplied with a cord tire and tire cover. The top is capable of being lowered, and to protect the rear deck, nickel plated bars are used. Runningboards are of the conventional type but are equipped with aluminum scuff plates.

### ONLY A FEW PRICE CHANGES ANNOUNCED

As at New York, the price situation is proving one of the quiet notes of the show. Changes on the opening day were few and far between and the salesmen are not relying on reductions to interest their prospects. They talk quality, service, mechanical features — almost anything, in fact, but changes in list.

Only four changes were announced on Saturday and, of these, two were increases and did not affect the entire line, either. Peerless was one of the two to mark up a new card on two of its models, advancing the four-passenger suburban coupe from \$3400 to \$3550 and the two-passenger coupe from \$3300 to \$3400. Maxwell added \$40 onto its sport touring, making the new price \$1025, and \$15 onto the sport roadster, making it \$975.

Pilot made substantial reductions in its entire line, the biggest cut coming on the sedan, which was trimmed \$505. The new list now reads as follows:

	Old Price	New Price
Five-pass. phaeton	\$2,000	\$1,695
Seven-pass. phaeton	2,050	1,745
Sport model	2,100	1,745
Coupe	2,950	2,445
Sedan	3,000	2,495
Seven-pass. sedan	3,150	2,645

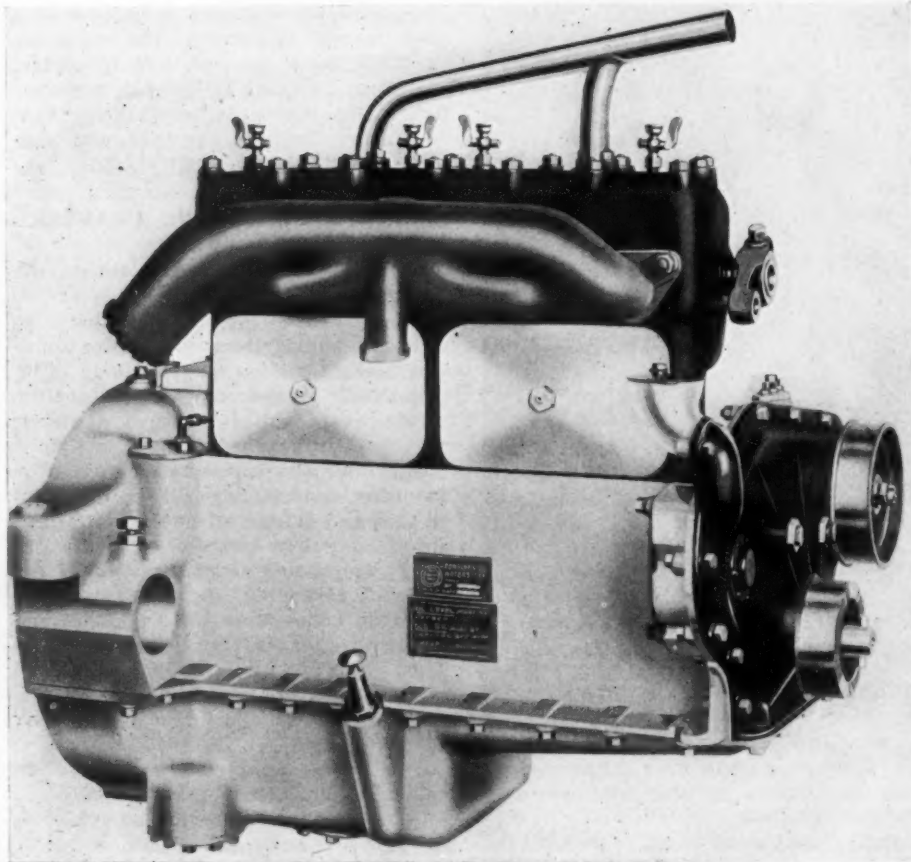
Climber, which did not show at New York but which made its appearance here, announced reductions of from \$2250 to \$1695 on its open models and of from \$2750 to \$2250 on the closed jobs. In addition, it displayed a new roadster, a six-cylinder, which was tagged \$1095.

Lexington, bringing out its new Skylark, a sport model, has placed on it a price tag reading \$1795.

### "CARS WOULD DRAIN A LAKE OF GASOLINE"

Sprinkled among the decorations of the Coliseum are signs prepared by the National Automobile Chamber of Commerce, each carrying some message bringing out the utility of the automobile or some pertinent fact of general motoring interest. One of these signs which was supposed to be speaking of cars in general, read: "Our cars would annually drain a lake of gasoline a mile square and 20 feet deep." It so happened that this particular sign was hung in the exhibit of a low-priced car whose maker took pride in the low gasoline consumption of his product and the placard looked as if it was part of the exhibit. It hung there for several hours before the salesmen "tumbled." After several prospects had made sarcastic remarks about gasoline consumption and kidded the salesmen about a car that could do twenty inches to the gallon, going by the placard, the sign was moved.





Right side of model K4,  $4\frac{1}{8} \times 5\frac{1}{4}$  Red Seal Continental engine, showing particularly well the accessible oil draining device on the lower half of the crankcase

## Continental Shows New Line of Red Seal Truck Engines

AMONG the engine exhibits there is the full line of new Red Seal Continental engines incorporating the following models: Model J4,  $3\frac{3}{4} \times 5$ , for 1 to  $1\frac{1}{2}$ -ton trucks; K4,  $4\frac{1}{8} \times 5\frac{1}{4}$ , for 2 to  $2\frac{1}{2}$ -ton trucks; L4,  $4\frac{1}{2} \times \frac{1}{2}$ , for 3 to  $3\frac{1}{2}$ -ton trucks; B5,  $4\frac{3}{4} \times 6$ , for 5-ton and larger.

All of these engines are four-cylinder and each engine in this line is built in accordance with the same basic design, has the same features and the same fundamental distinctions which have been characteristic of Continental engines in the past.

The purpose of this line of engines is rather far reaching. In their design and construction three main factors stand out prominently. First, an unusual degree of standardization and interchangeability, which gives the company a manufacturing proposition which lends itself to accuracy of production, quality, uniformity and good construction in general. Second, owing to the interchangeability of parts, new possibilities are opened up for economical manufacturing, and particularly in the way of a new standard of quality at the lowest price which the industry has as yet had. Third, the standardization and interchangeability of parts is such as to permit a more elaborate manufacturing and tool equipment than has been possible in the past.

Some idea of the interchangeability of parts may be had when it is realized approximately 77 per cent of all the different parts in this complete line of four engines are common to one another. In other words, of approximately 274 different parts which go to make up each of these engines, 211 are common to all models. This unusual accomplishment is not limited merely to such items as bolts, cap screws, etc., but to each member unit as well, where it has been possible to do so.

Aside from the difference in cylinder dimensions, etc., the engines have the following characteristics. The cylinders are cast in blocks and are fitted with detachable heads. The engines, of course, are of the L-head type. The crankcase is aluminum, while the upper part of the flywheel housing is cast integral with the crankcase. The pistons are of gray iron and the connecting rods of the conventional I-beam type. Crankshaft bearings are of bronze, faced with a white metal alloy. Connecting rod lower end bearings are of the same type. Each camshaft bearing is one piece of white metal alloy. Mushroom type of pushrods ride directly on the cams of the camshafts.

Inlet and exhaust manifolds are grouped in a single casting, so arranged that the inlet gas is heated to the right temperature under varying atmospheric conditions.

Lubrication is of the full pressure feed type and a pressure control valve automatically protects the oil system. Cam-

shaft bearings, cylinder walls and valve mechanism are lubricated by oil thrown off from the connecting rods.

These engines will be completely described in detail in a forthcoming issue.

## Dort Harvard Coupe

THE Dort Harvard coupe, although previously mentioned, in the Nov. 2 issue of MOTOR AGE, makes its first show appearance at Chicago. It was not shown at New York. This model is available on either the four-cylinder chassis or on the six, the prices being, respectively, \$1240 and \$1355, f.o.b. factory.

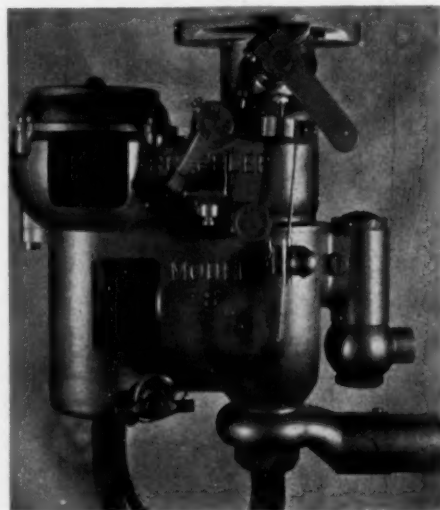
This is a three-passenger job with seats somewhat lower than in other models and with the top correspondingly lowered to give a pleasing effect. Disk wheels are regular, and an adjustable sun visor is also provided. Broadcloth is used in the upholstery and the coupe type body lends itself to the construction of the rear of the body such that ample luggage space is available.

## NEW MERCHANDISING POLICIES ARE POINTS OF INTEREST FOR DEALERS

Two radical departures in the merchandising of automobiles which were announced during the show season were among the central points of interest at the show here this week for the dealers who by now have had time to study and become familiar with the new policies.

The most striking announcement was that of the Cole Motor Car Co. of Indianapolis, eliminating trading in used cars by that company's dealers as a means of making the dealer's business more profitable under the new reduced discount put into effect with the sweeping price reductions on the various models.

Dealers generally were inclined to regard the Cole policy as an interesting experiment, the results of which the in-



Wheeler & Schebler had on exhibition a gigantic model of its carburetor. This model was about 3 ft. high and was made in the company's pattern shop. It was a working model

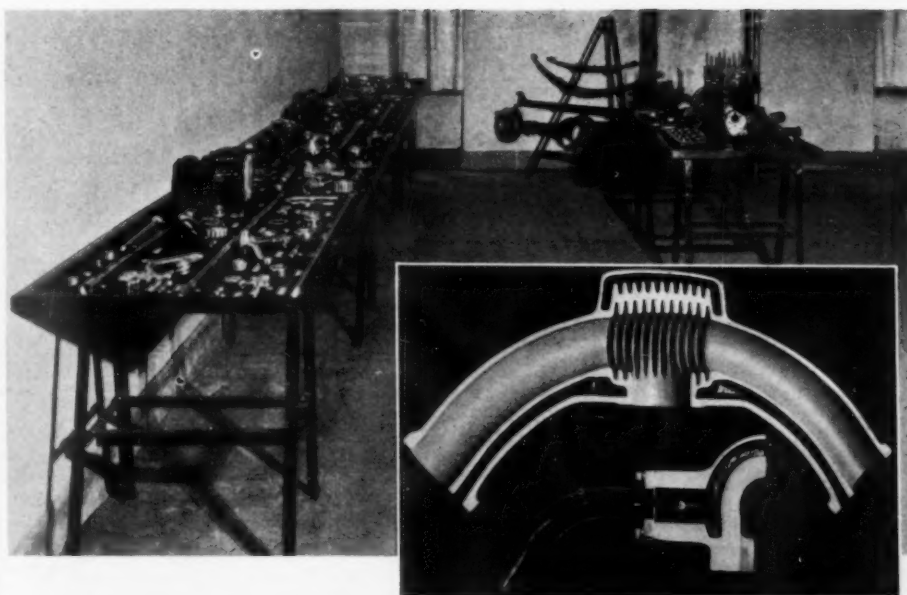


dustry could afford to observe very closely. Cole dealers themselves seemed well satisfied with the new plan, and Eugene Silver, president of the Cole Motor Car Co. of Illinois, one of the largest distributors of Cole cars, was enthusiastic about it. Silver announced the new policy in full-page newspaper advertisements on Thursday morning. That day he, he said, sold five cars, the next day four and on the opening day of the show four more sales were made.

"This policy is the very thing the automobile industry has been waiting for," Silver said. "I predict that within a few months a number of manufacturers will have adopted the plan and then it will become general."

For the plan to succeed, Silver said, there must be a much wider distribution of Cole cars than formerly and the radical reductions of \$600 to \$800 on the various models are calculated to bring about that distribution. Silver has opened four new retail stores in Chicago.

Although the Cole dealers will not buy used cars or accept them in trade, they will undertake to sell the old cars of customers who desire to purchase new Coles. They will put the old car on the floor and get the best possible price for it, charging the customer a commission and a fixed overhead charge to cover the cost of handling. In case a customer wants to buy a new Cole and expects to use the proceeds of his old car sale on the first payment, the Cole dealer, upon



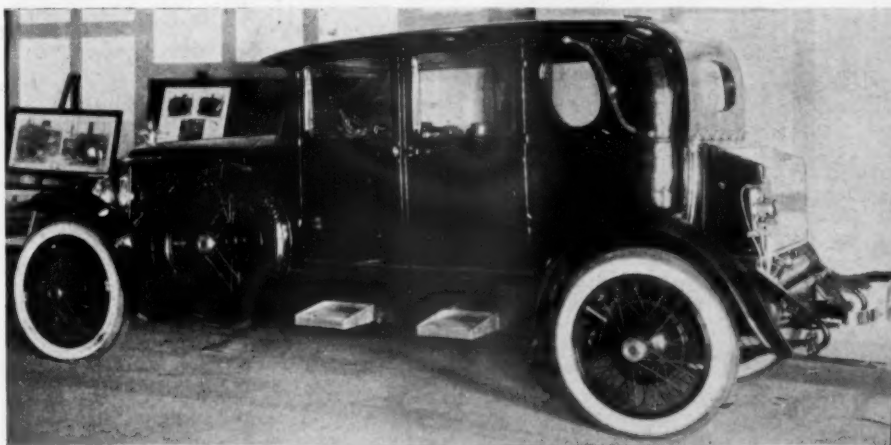
Here is shown how the Lafayette and Star revealed some of their mechanical details at the national shows. The Star exhibited practically every unit which goes into the manufacture of its car, while Lafayette showed a sectional intake manifold, which clearly illustrates how the intake gas is heated by the surrounding exhaust jacket

getting possession of his old car, will accept his 90-day note for the sum at which the dealer appraises the old car.

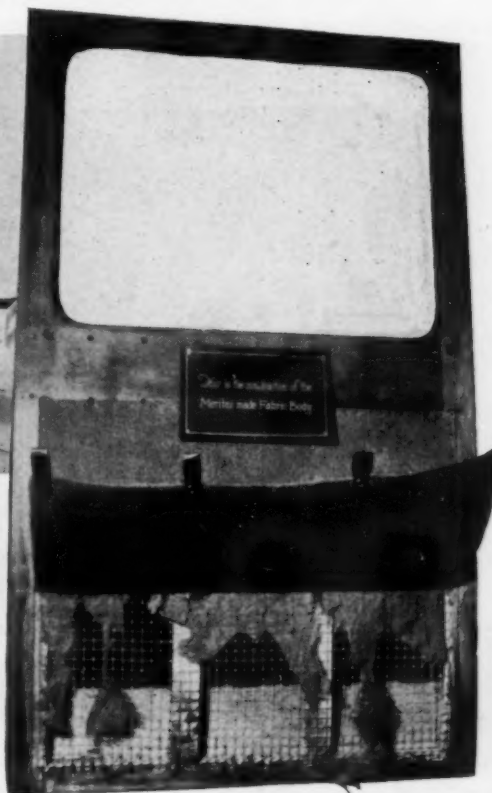
The other new policy attracting attention was that of the R & V Motor Co., under which the engine of the company's new car is sealed upon leaving the factory with a metal band which is not expected to be removed for two years. This amounts to a two-year guarantee against engine trouble, and the R & V

dealers believe this will prove to be a very popular policy. Daniel Boone, head of the Chicago company distributing R & V cars, was especially pleased with this feature. The other part of the new R & V policy, under which any dealer in any line of cars might take orders for the R & V without carrying any in stock and receive a discount of 10 per cent, was considerably discussed, but few definite opinions of it were expressed.

## Fabric Body Attracts Attention



The all-fabric body shown at the Chicago show attracts much attention because of its unusual construction. Instead of using metal panels over a wood frame, the latter is first covered with wire, which is No. 19, with two meshes to the inch, and fastened with staples. Then follows a material known as buckram, a sort of stiff burlap. One layer of cotton wadding is placed between the wire and the buckram. The body is then ready for the application of the fabric. It is claimed that a fabric body can be kept looking fit much more easily than a paint surface on a metal body. Another commercial merit is that the time usually needed for painting is saved. This body is naturally light. The body exhibited is on a Packard chassis. The Textile Products Co. is sponsoring this new body construction



## An Education at the Show

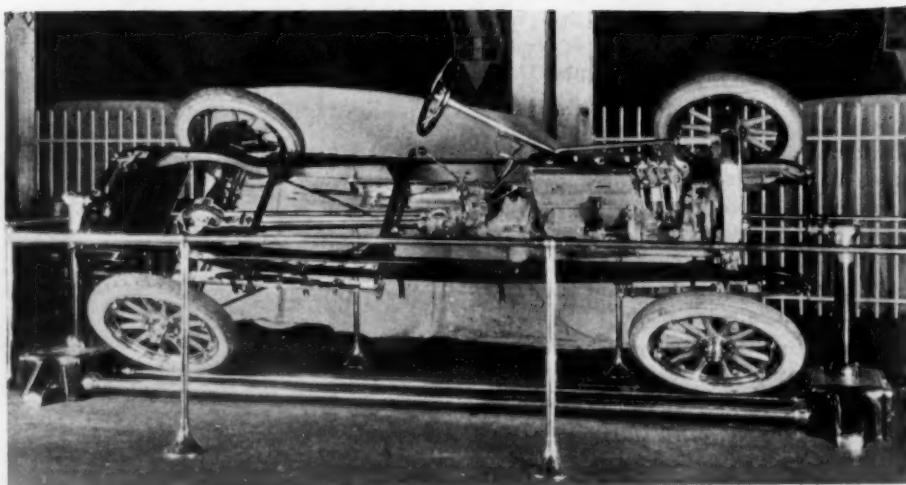
THE transition of the automotive craft from a game to a business is a thing that has been taking place for years. The transition of the car user from gambler in the unknown to careful purchaser of the tried and proven has occurred at the same time. Efforts of manufacturers are seen in the exhibitions at the Chicago show, where facilities are everywhere available to the intelligent purchaser to inform himself still more on the details of motor car construction.

An engine is known by what it contains and not by its outward appearance, and the exhibits are characterized by the frequency of the cut-away models. Portions of the case are cut away so that the crankshaft action can be seen. Lights are so placed that the internal action can be clearly seen. Camshafts in action show the transmission of motion to the valves, and sectional ports show where the gas enters and leaves the cylinders.

The Dort exhibit includes such a cut-away model. Transmission and clutch housing have portions cut away and replaced with glass windows, through which we see the show. A window in the rear axle shows its action. Crankcase and valve chamber also reveal the source of flowing power, and lights at every strategic point show every essential action in the whole mechanism.

Jordan features such a cut-away engine where the moving parts can be seen, while Velle follows suit with a model in which the lighting is well arranged. Pistons as well as other parts are cut away so that the method of fastening the piston pins can be clearly seen.

Maxwell has the motion of the rear axle, transmission, clutch, crankshaft, valves and pistons shown, nor are the cars here mentioned the only ones to



*In order to show the buying public a little more clearly what it is all about, Buick sees fit at the show to use a revolving chassis. The demonstrator can swing the car into any position desired*

appreciate this method of showing the car user what it is all about.

On the air-cooled Franklin and the copper-cooled Chevrolet the direction of air currents in the cooling system is shown by streamers. An electric motor is used to run the blower, and the ribbons and lights tell the story.

In the matter of sectional visibility Buick supplies a novelty in not only cutting away various portions of the car, but in mounting this sectional chassis on turnions, for and aft, so that the salesman in explaining various points can turn the car over at will to show any part in question. The radiator is cut away, showing the water and air passages. Propeller shaft and moving portions of rear axle are easily seen.

This method of showing construction was especially significant in the case of the gear type oil pump. This was easily seen when the chassis was turned on its

side, for portions of the lower crank case pan were cut away, and in addition to seeing the pump in operation, a separate sectional pump was available. This was used in demonstrating the friction type drive, by means of which relief was provided in the event of excessive load on the pump.

## Gasoline Consumption Shows Increase Over 1921 Records

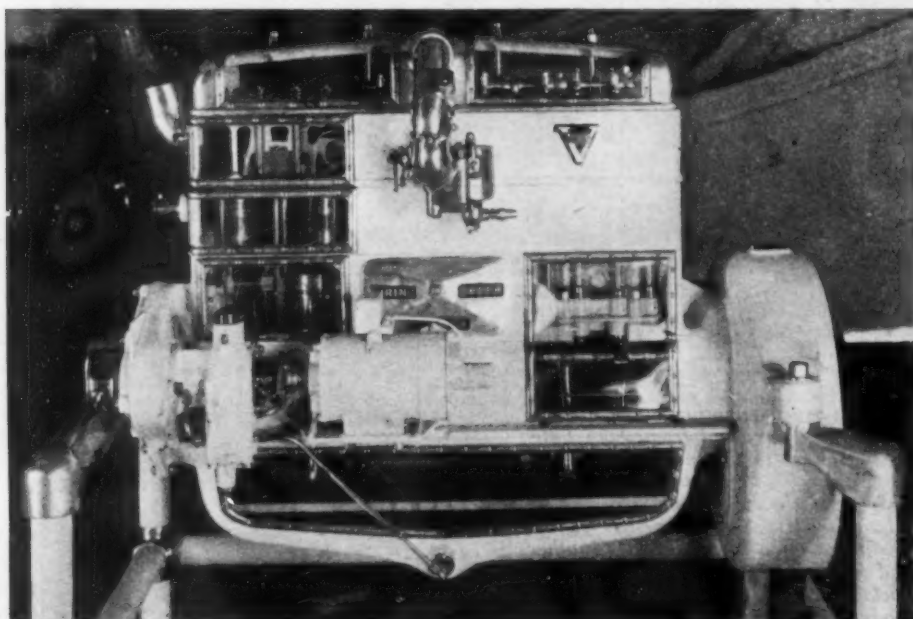
WASHINGTON, Jan. 29—Consumption of gasoline in November, 1922, increased 34.09 per cent above the figures for the corresponding month in 1921, according to statistics compiled by the Bureau of Mines. Measured in gallons the increase amounted to 120,000,000. The total consumption for November, 1922, reached 470,043,173 gallons. The Bureau says, "the demands of the nation's millions of internal-combustion engines continue to maintain gasoline consumption at a dizzy pace."

Production of gasoline amounted to 567,100,921 gallons, an increase of a million gallons over October and 31.31 per cent over production for November, 1921.

November gasoline consumption figures were, however, 19,000,000 gallons below the October consumption mark, due, doubtless, to the advance of winter and the consequent curtailment of automobile activities.

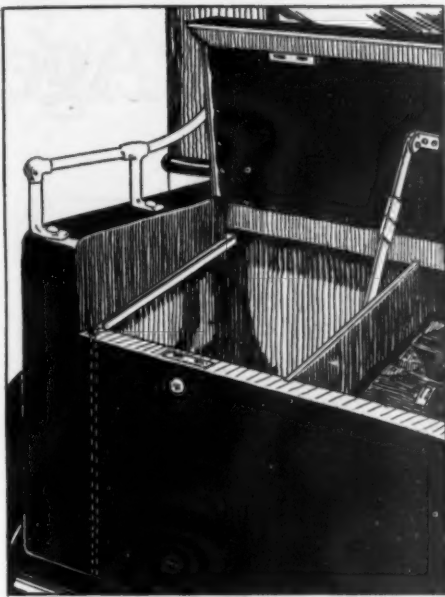
## N. A. C. C. GUIDE PUBLISHED

NEW YORK, Jan. 29—The 1923 Hand Book of Automobiles has been issued by the National Automobile Chamber of Commerce. It illustrates 229 models of motor cars. The total number of car models and truck chassis listed is 834. The book is intended to be a guide to the motor vehicles being manufactured this year. It is published at 366 Madison avenue, New York, and may be obtained by dealers at 50 cents a copy, which the N. A. C. C. says only partially covers cost.



*One of the best examples of a cut-away engine in which the parts are moving is the Velie. Such exhibits are of great value in showing the layman what the "insides" look like*





On the R & V a drain is provided on the interior of the trunk to carry off any water which might find its way to the inside

### How Does It Work?

EFFORTS at the Chicago automobile show, while directed toward the sale of cars and accessories, are made from a somewhat different angle than formerly. Particularly is this true in the accessory field, where devices for more efficient or comfortable operation are not only being shown but in many cases it is being proved that they will accomplish what they claim.

The problem of wear in bearings and cylinder walls is found to be due at least to a great extent to the abrasive action of dust and dirt drawn into the engine with the air that enters through the carbureter. The Stewart-Warner Speedometer Corporation shows a device which, while primarily designed for use on trucks, may eventually be a possibility for passenger cars as well. It includes a series of circuitous passages through which air to the carbureter must pass, and in passing it goes through water, which is clearly seen in the demonstrating model.

The water picks up the dust out of the air and later deposits it in a glass jar. Operation of the device for perhaps six hours had already deposited about an eighth inch of dirt in the glass receptacle, and this fact was certainly illuminating to the average observer.

Shock absorbers have for years been used to a greater or less extent to reduce the rebound action of the springs. It has also been recognized that for best results the retarding action should be graduated in proportion to the spring deflection. A demonstration of such shock absorbing action is made at the booth where Watson Stabilators are on display.

This demonstration stand comprises a framework on which the stabilator is mounted, and a foot rest on which a person can stand. When one's weight is first put on the foot rest it sinks very slowly, this position corresponding to

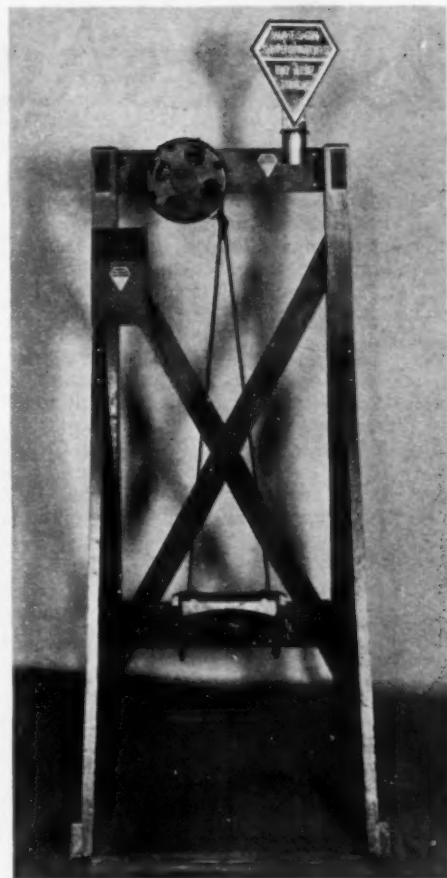
the upper position of an axle, where the car has hit a bad bump. As the weight of one's body gradually forces the foot rest downward, it starts to go with increased ease, and at the extreme lower position, corresponding to a spring normally stressed, and operating over small bumps, the action is quite easy. It is now possible to move the foot rest down with but very little effort.

Theory is one thing, and practice—sometimes a disobedient child—is often quite different, but demonstrations of this kind show the man who thinks just what the possibilities of the various displays really are.

### 2,000 Chicago Salesmen at Pre-Show Pep Meeting

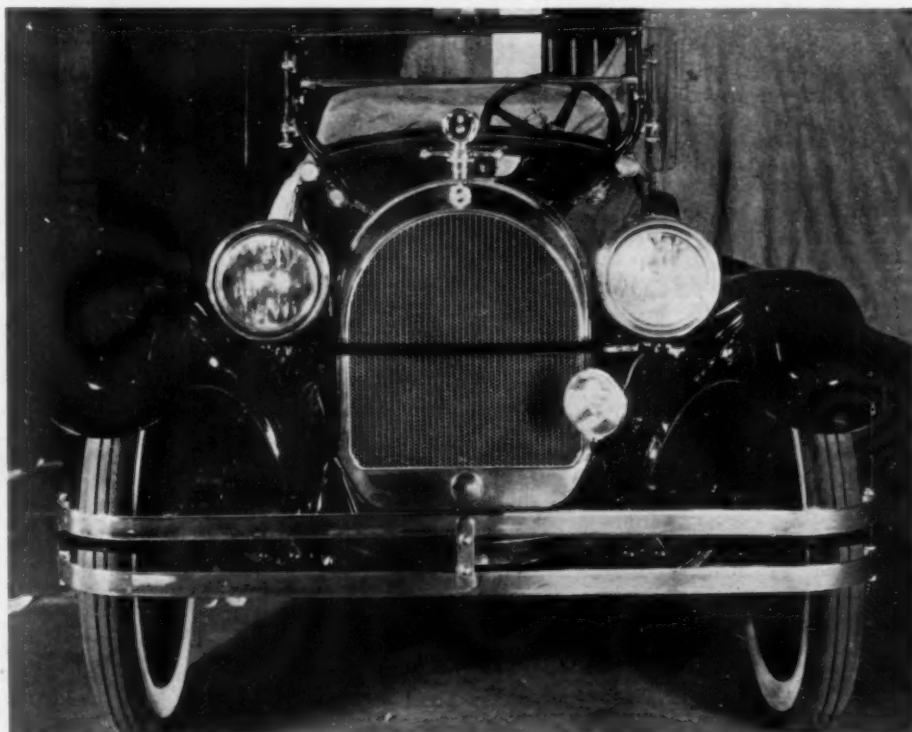
More than 2,000 salesmen allied with companies members of the Chicago Automobile Trade Association held a dress rehearsal at Orchestra Hall Friday night to prepare themselves for a strenuous week by learning the benefits of co-operation and optimism. It was announced that substantial cash prizes would be awarded to those salesmen who come closest to the ideals of the C. A. T. A., and all were urged not to knock competitors and to answer cheerfully all questions as to the immediate future of the industry and the state of business.

President Thomas J. Hay handled the meeting well and speeches were made by Charles F. Kettering, president of the General Motors Research Corp.; ex-Congressman Adam Bede of Minnesota and Harry N. Toles, a sales expert. Kettering, as usual, held his audience throughout and drove home the point that nothing is impossible. "Tell me why a thing can't be done and I can tell you how



"Wouldn't it jar you?" is not the case here, because the Watson Stabilator with this apparatus shows how the road shocks are softened

it can," said Kettering, and he illustrated this by reciting incidents where the seemingly impossible had been accomplished by careful thinking and planning.



Oldsmobile Sport Model is now regularly equipped with a spotlight mounted as shown here. This gives the driver better vision and affords an excellent road light



# 23 Years Ago This Week In Motor Age

(From MOTOR AGE of Feb. 1, 1900.)

BOSTON, Jan. 27 (1900)—Boston has had its first automobile wedding. All the guests that attended the wedding of Miss Mary Walsh, of Roxbury, to Charles E. O'Connor at the Mission Church this week rode to and from the church in electric cabs and runabouts from the New England Electric Vehicle Transportation Co. The groom is connected with the company and, in compliment to him, to say nothing of the retrograde step it would be for the guests to be drawn to the wedding by horses, the company placed the vehicles at his disposal. It was a very picturesque exhibit along the street near the church door and excited a great deal of comment by the passers.

## More About the New York Show

NEW YORK, Jan. 29 (1900)—It was really wonderful the amount of attention the automobile portion of the "Cycle and Automobile Show" attracted. It is safe to say that there were more questions asked of the even dozen of motor vehicle exhibitors than from the many scores of those who showed bicycles and accessories and that the even thirty of horseless vehicles attracted more attention than all the rest of the show. Viewing the exhibition from the galleries, the various motor vehicle stands could be located from the black throng of humanity around each.

The visitors were not content to stand outside the booths and ask questions but insisted on crowding through the gates and climbing over the railings and plying the tired exhibitors with scores of questions which served to show the interest in the motor vehicle problem and, at the same time, their almost universal lack of any understanding of the real nature of the vehicles themselves.

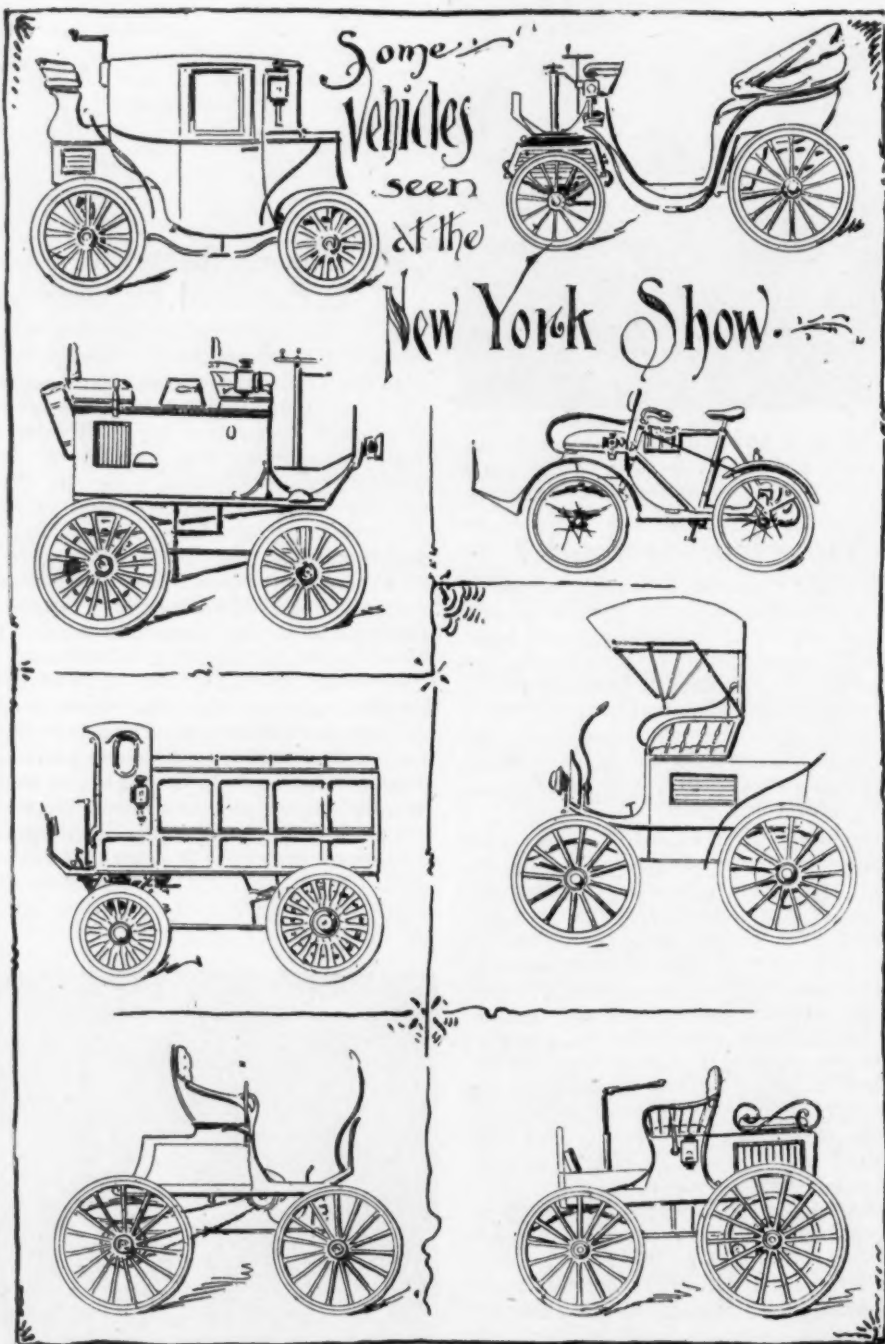
The ignorance of the public cannot be better illustrated than by an example: One of the best known makers of electric vehicles engaged, for the week of the show, a salesman who had absolutely no knowledge of the vehicles which he was expected to sell—nor any knowledge of any motor vehicle. Before the show was two days old he had sold one vehicle for \$1200 and one for \$1500.

## Motor Miscellany Gleaned at the Show

Exhibitors at the show were driven to death with applications for agencies. No make could be found who was in position to fill any number of orders. The chief anxiety is seemingly to catch up with the orders of the present and a number of clever advertising schemes presented to makers received scant attention.

Harry Stevens, the Madison Square Garden caterer, could not withstand the pressure of the show of automobiles. Mr. Stevens finally came forth from his hash producing den and purchased what he describes as a "b-a-a-u-tiful machine."

Motor vehicle exhibits of the future



will be on a grand scale providing some of the many plans spoken of during the show come to a head. (They must have!—Ed.)

## First Long Distance Club Run

NEW YORK, Jan. 27 (1900)—The Automobile Club of America today successfully promoted the first long distance motor vehicle club run ever pulled off in this country. The occasion was the formal opening of the country clubhouse at Kingsland Point, near Tarrytown, the use of which John Brisben Walker has given the club. The distance of the run for the round trip was 56 miles and the

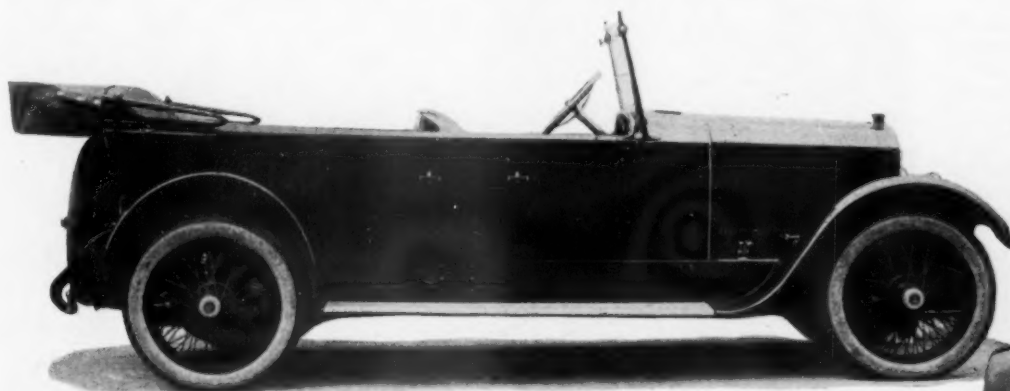
start was made from the Waldorf-Astoria at 11:05 o'clock.

## The Real Inventor

The Automobile Club of France some months ago appointed a committee to ascertain who was the real inventor of the automobile. The committee now (1900) reports that M. Lenoir, who on Jan. 24, 1860, took out a patent for a motor operated by the explosion of gas, is entitled to the honor. Lenoir, who is still alive and aged 78 years, was discovered in an obscure village. The Automobile Club is now organizing a big fete in his honor and will present to him a handsome gold medal.

## Tarkington a New Car in the Six-Cylinder Field

*Chassis Shows Many Refinements, Among Them Being the Use of Polished Steel Ball Ends on the Tie Rod in Place of Usual Yoke Ends. Engine of Overhead Valve Type. Frame Side Rails Have 8 In. Depth. Straight Lines Characterize Body*



*Straight lines characterize the body of the Tarkington car. The side rails of the frame are finished the same as the body inasmuch as they are exposed to view. Front view of the Tarkington, which gives a good idea of the body lines and windshield layout*



THE latest addition to the six-cylinder field is the Tarkington, made at Rockford, Ill., by the Tarkington Motor Car Co. Straight lines characterize the body while a low center of gravity has been obtained by underslinging the springs and by other structural features of the chassis. The wheelbase is 126 in. Wood wheels are regular equipment and these carry cord tires 32 by 4½ in.

The body is aluminum throughout and is upholstered in genuine leather over Marshall springs. There are two leather trimmed folding chairs in the tonneau. The windshield has been designed to conform to the body lines and is essentially a part of the cowl structure. Cowl lights have been cleverly mounted in the windshield stanchions. The outside line of the windshield is straight and it therefore makes a neat job when it comes to attaching side curtains. The severity of straight lines has been relieved by making the lower windshield curved at the ends.

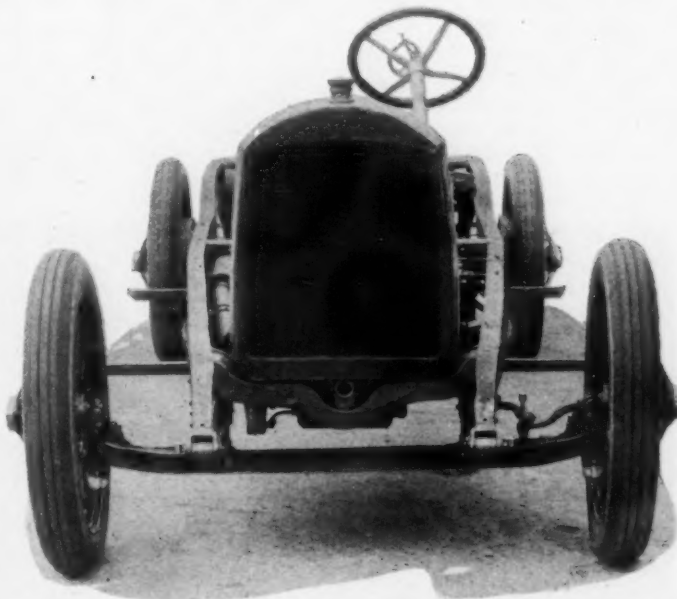
The car is fitted with a Pantasote top and the side curtains open and close with the doors. The instrument board is of walnut and carries the usual quota of instruments consisting of ammeter, oil and gasoline gage, Warner speedometer, clock, light ignition and light switches. A cowl ventilator is conventionally placed.

The starting, lighting and ignition systems are Delco make and one of the features in connection with the car's lighting system is said to be construction and placing of the headlamps in such a way that auxiliary headlamps light the right half of the road and right-of-way without blinding the driver of an approaching car.

Fenders have been made quite substantial, the front fenders being very wide and crowned. There is a wide tapered ledge to prevent mud throwing. The skirt of the front fender extends to the tip of the frame horn and is attached directly to the frame. The front splash apron extends from tip to tip of the frame horns. The rear fenders are fitted into the wheel bushings of the body and also are equipped with a wide ledge to prevent mud throwing. At the rear of the frame there is an apron to stiffen the frame and protect the gasoline tank. The latter is of 20 gal. capacity and

fitted with gage in addition to the gage on the instrument board.

One of the interesting things about this car is the deep side rails of the frame, these being 8 in. The frame has a 5½-in. kickup at the rear and the contour of the frame coincides with the sill lines of the body. The running boards are of laminated wood construction, similar to aircraft construction, and are a com-



*Front view of the Tarkington chassis. The oil pump assembly will be noticed at the lower right hand corner of the engine. It is very accessible*



posite part of the frame. This serves also, it is said, to deaden the noise.

Springs are semi-elliptic, front and rear, being respectively 37 by 2 in. and 58 by 2½ in. The spring shackle bolts are ¾ in. in diameter and hardened thrust plates prevent wear at this point. Spring bushings are bronze, with pressure oil lubrication.

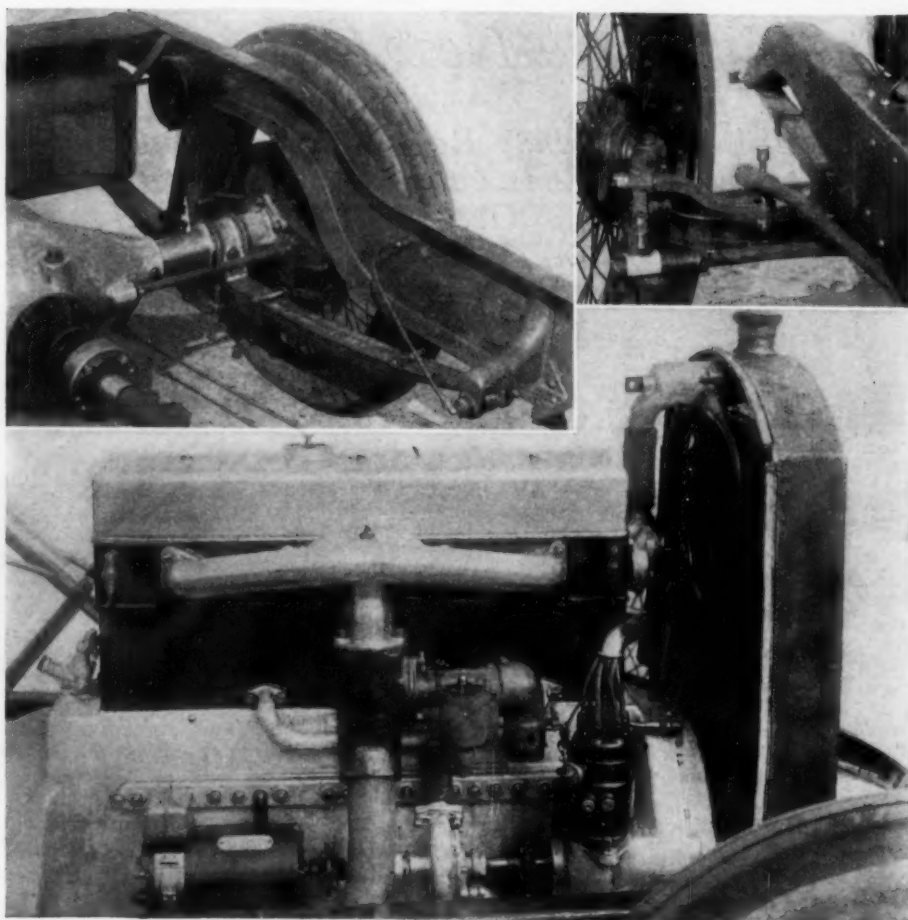
The front axle is an I-beam, drop forged and heat treated. It is of the reversed Lemoine type with a reservoir for holding sufficient oil to last an entire season, it is stated. Another interesting feature of the front axle is the use of ball joints, in place of the conventional yoke-end construction on the tie rod connecting the steering knuckle arms. These balls are ground and polished. This construction naturally should make for easy steering, in as much as all chance binding is eliminated.

A semi-floating rear axle is used, having an aluminum alloy center housing. The axle shaft tubes or housings are 3 in. in diameter and shrunk into the center housing. The differential has a four-pinion spider, with Timken bearings used throughout. The entire differential can easily be removed through the rear of the center housing. Axle shafts are splined into the differential.

The steering wheel is a Jacox fitted with an 18 in. wheel. The dimmer switch and engine controls are mounted in the hub of the wheel.

A valve-in-the-head type of engine is used, having a bore and stroke of 3½ by 4½ in., giving a piston displacement of 260 in. The engine is a cast-in block design with aluminum crankcase. Both manifolds are on the outside of the block. The fuel mixture is gassified in a saxaphone which preheats the heavy ends of the fuel and distributes the mixture evenly to each cylinder.

The engine is lubricated by a pressure system and one of the novel things in connection with this is the accessible location of the oil pump. The oil pump assembly is located at the lower forward right side of the engine. It is removable by breaking two oil leads and removing four cap screws. It is the intention of the company to carry the pump in stock and service it as a unit. The oil pressure



Upper left—The front axle layout of the Tarkington showing the ball joints on the tie rod in place of the usual yoke end construction. Upper right—Method of suspending the rear spring on the inside of the frame siderails. It also shows the aluminum differential housing. Below—The right side of the Tarkington engine, which shows the accessibility of the electrical units, carburetor and water pump

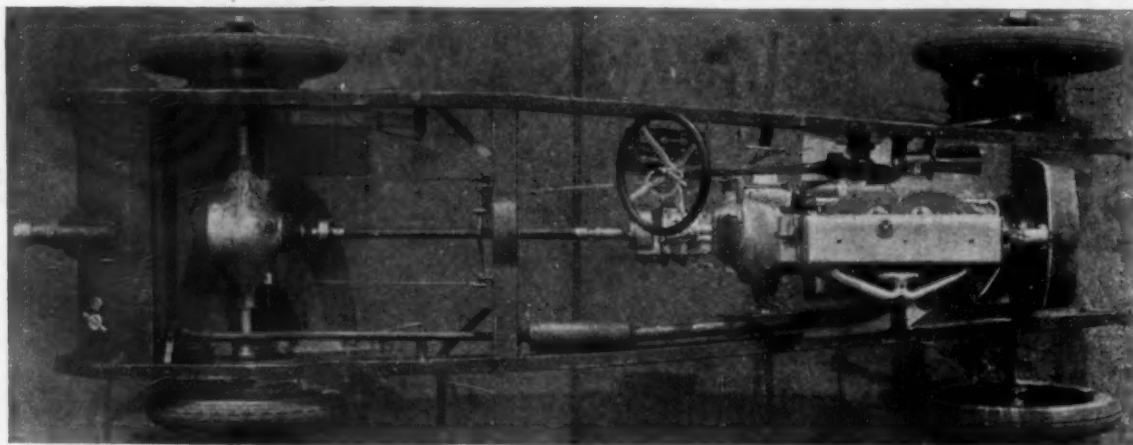
sure is controlled by the throttle position.

There is a force feed to the piston pin. The push rods are of aluminum with steel cups at the top and steel balls at the bottom. Oil runs down the push rods from the duct in the rocker arms, thus cushioning the entire valve lifter assembly and the cam.

The engine is cooled by a pump system and one of the noteworthy things here is the extremely accessible location

of the pump. The same is true, in fact, of all the engine accessories. Removal of the generator, which is driven by a shaft through the pump, does not interfere with the ignition unit.

From the engine the drive is through a dry-plate clutch, to a three-speed gear-set, which has an aluminum housing, nickel steel gears and operates on annular ball bearings. The propeller shaft is tubular and is fitted with two universal joints of the metal type.



Top view of the Tarkington chassis, which clearly shows the unusual manner of placing the rear springs



# How Motor Cars Traversed 2,000 Miles of Desert

*French Citroën Expedition Conquers Sahara in Thrilling Run—No Supply Station in 1000 Mile Stretch*

PARIS, Jan. 10.  
(By mail)

**L**EAVING Touggourt, in Southern Algeria, at 5 a. m. on Dec. 17, five Citroën automobiles with the Kégresse system of flexible creeper bands, entered Timbuctoo at 10 o'clock on the morning of Sunday, Jan. 7, thus having occupied 21 days 5 hours in making the journey of about 2000 miles across the Sahara desert. By thus linking up the Algerian province with French possessions on the west coast of Africa, and accomplishing a journey which normally occupies seven months, immense trade possibilities are revealed.

The object of this expedition, undertaken by the Citroën Automobile Co., with the encouragement of the French government, was to prove the reliability of the Kégresse system of propulsion over desert wastes closed to all but camel convoys, and to establish an overland trade route to French West African possessions.

In French trade, administrative and military circles, immense enthusiasm exists because of the complete success of this mission, for it is recognized that with adequate organization a regular automobile service can be established across the Sahara, thus tending towards the better development of French possessions in Northern Africa. Plans are already being laid with this object in view.

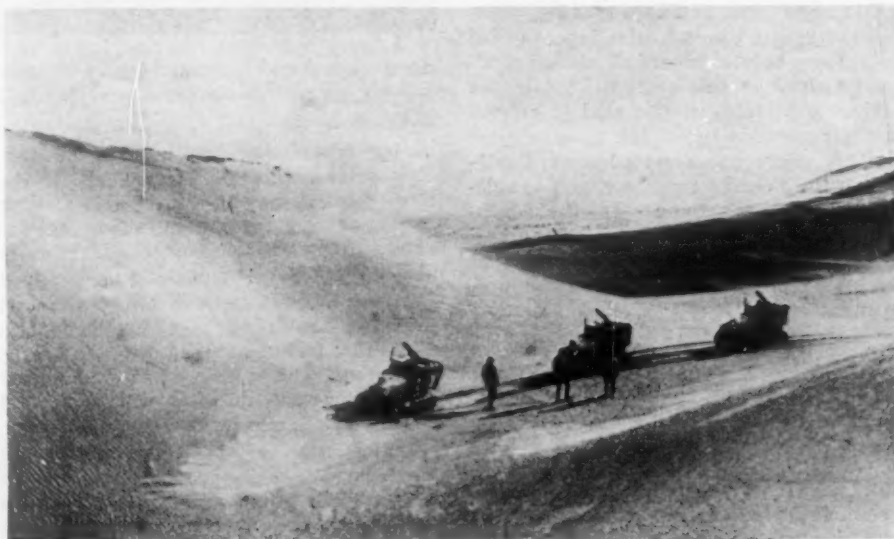
The success of this enterprise is due in a large measure to the careful organization for which the Citroën company was responsible. More than a year was spent in preparing for the trip, and so well were the plans laid that when the mission went away from Paris early last December success was practically assured.

Mechanically, there is very little difference between the five Citroën-Kégresse cars which crossed the Sahara and the regular machine produced in the Citroën factory. It was found that additional radiating surface had to be provided not only to prevent overheating during heavy going in the heat of the day, but to provide against any necessity for taking on supplies of water in the desert. There was one stage of 500 miles with no water available, and if the wells had been missed the distance without water might have been increased to more than 900 miles. Provision had to be made for cooling with a hot following wind, the velocity of which was equal to the speed of the cars.

Weight and fuel economy were the



*Raising the tri color of France at one of the desert stopping places*



*The Citroën-Kégresse caravan near In Salah, in the Sahara Desert*

greatest problems to be faced by the engineers. As a distance of nearly 1000 miles had to be covered without any outside supplies of gasoline being available, weight had to be saved wherever possible in order to permit the carrying of enough fuel for this stage, and gasoline consumption had to be cut down to the lowest figure.

Other automobiles of the same general type carried supplies southward as far as In Salah and northward to Kidal, but between these two points, a distance of 950 miles, no supply stations existed. By reason of the heavy going which had

to be encountered in many parts of the Sahara, the gas consumption worked out at nine miles to the gallon. While establishing the supply stations at different points in the desert, valuable technical experience was acquired and the crews gained an intimate knowledge of conditions in the Sahara which served them well when the through trip was undertaken.

George M. Haardt, managing director of the Citroën Automobile Co., took charge of the expedition in conjunction with Lieut. Audouin-Dubreuil, aviator and African explorer.

# Heavy Selling Is Feature of Pacific Coast Show

*Season Is Opened at Oakland to Excellent Attendance and a Sharp Demand for Cars Is Evidenced*

OAKLAND, Cal., Jan. 20.

THE Oakland Automobile Show, held under the auspices of the Motor Car Dealers' Division of the Alameda County Automobile Trade Assn., and managed by Robert W. Martland, proved the leading event of all the cities around San Francisco bay for the week from Jan. 13 to 20, inclusive. While the models shown had been previously exhibited in the east, many of them were presented for the first time on the Pacific coast, a few having been shown before at Los Angeles.

The Oakland exhibition was held in the Municipal Auditorium and attracted exhibits from forty-one dealers and nearly a score of equipment men. It developed several features new to Pacific coast shows, the most important being that the dealers, as if by common consent, made this a selling show, not merely an exhibition, nor yet a field for the collection of prospects, but a market for the actual sale of transportation.

The show was extensively advertised, and the result was an attendance larger than ever before recorded at an automobile show in this section. While the dealers exhibited all the models offered in their various lines, the greater part of their effort was directed toward selling on the floor of the show, and to selling not so much the motor, the equipment, the body, or the finish of the car, as its ability to transport its owner at the lowest possible cost for maintenance, gasoline and oil.

## Massed Selling Attack

The result was a massed selling attack by these two-score dealers which got results, not alone for the car offered by each individual dealer, but for all the cars shown at the show. The public, too, manifested a decided tendency to buy transportation rather than car appearance. The result was a more discriminating set of buyers, as well as a larger proportion of spectators who attended the show with the definite purpose of buying when they had decided which car would give the best transportation. As a result of this effort on the part of the dealers, and of this attitude on the part of the public, sales were greater by nearly 100 per cent at this show than they ever have been at any of the several previous shows held here.

The majority of the cars sold were priced at from \$1000 to \$1500. Automobile dealers in Oakland, and in San Francisco also, began advertising shortly before the show, the prices of the cars, delivered here. Hitherto, most of this



*An average crowd at the Oakland, Cal., automobile show, held from January 13 to 20, inclusive. On the opening night, the attendance was larger, even, than this*

dealer advertising has quoted the factory prices, and the dealers credit the new advertising of local prices with many of the sales they made at the show. Though some of the exhibitors showed cut-down models and stripped chassis, there was less effort than at previous shows to impress the public with the technical points of the cars exhibited. The selling talks were based on performance, mileage per gallon, and cost of upkeep.

Indications are that the people in northern California are paying more attention than ever before to maintenance costs and to mileage obtainable, and scores of cars were sold at this show on no other basis than successful sales talks along these lines. It was essentially a merchandising show, and, due to the success made by the exhibitors along these lines, the San Francisco show, from Feb. 17 to 24, will be conducted along the same lines. The majority of the exhibitors had several salesmen on the job with their exhibits all the time, and a number of the dealers had men, and women, in the crowd, guiding prospective purchasers to the exhibits of these dealers.

Open cars were shown freely, and there is little indication as a result of the show that the demand for these cars has fallen off to any appreciable extent,

yet the larger part of the exhibits were enclosed cars, and the heavy-weights of the various sales forces devoted most of their attention to the sales of these enclosed models. Rain and cold weather the opening night of the show, as well as on other nights during the show, helped to sell the enclosed cars, as did also extensive enclosed-car advertising in the newspapers before and during the show.

The dealers at this show also made another discovery. They found that the majority of the attendance during the daytime came with the fixed purpose—and the money—to buy cars. The attendance at night held a large percentage of sightseers, but the day crowds were there to be shown the car best adapted to their needs, and to buy it. This became apparent the first day, and the dealers immediately put almost as large forces on during the day hours of the exhibition as at night. A number of cars were sold to business and professional men during the evening hours, because these men could not take the time from their businesses to attend the show in the daytime, but the majority of the sales to women, and to men for family cars, were made in the day-time. Hitherto in Pacific coast shows, the evenings have been given the preference for sales effort.





H. M. Lawrence and the Cozzens-Ball Company put on an attractive truck and tractor display, in a setting appropriate to the general Egyptian plan of the decorations of the Oakland show.

The show opened daily at 10:30 a. m. and closed at 10:30 p. m. Decorations were extensive and expensive, more than \$15,000 having been expended on this feature alone. Music also was provided, but the main idea of the purpose of the show in the minds of those in charge of it seemed to be to afford the dealers the greatest opportunity to sell automobiles, that is, to make the show a great and productive market. Consequently, neither music, decorations, nor other attractions were allowed to detract from the sales feature of the exhibition. The result thoroughly justified the effort.

The Oakland show proved another condition in the mind of the public to all the dealers, and that is that an entirely new definition and meaning of "value" is guiding the purchaser of an automobile today. The prospective buyers at this show were one and all looking beyond a one or two year performance, or "life," in the cars they considered. They looked first for those qualities which will lessen their yearly

cost of transportation, and prominent in these qualities, of course, is the length of time they could expect a car to give them service. Thousands of men and women are thinking of their purchase of an automobile as an investment, in terms of five or more years of use, and with the prospect of a return on that investment, just as they would expect a return on any other sum they might invest in a business undertaking.

This attitude forces a radical change in the methods of selling automobiles. The people have learned valuable lessons in automobile finance, upkeep and engineering, as well as in the economy provided by manufacturers. This was plainly demonstrated at the show, when it was proved that the dealers who could offer a car with (1) a tangible and proved economy of operation; (2) longer length of service, and, (3) flat rate of repair operations, made the most and the quickest sales. The show, aside from the sales made, was invaluable to the dealers for this lesson alone.

#### Small Town Dealers Attend

All features considered, the dealers of Oakland, Alameda, Berkeley and San Francisco, who participated in this year's show, consider it the most successful, and the most profitable in point of actual sales that they ever have had. They are thoroughly sold on the idea of making the show a market place, not for individual makes of cars, but for all automobiles.

Inasmuch as many new models were shown, the exhibition attracted a larger number of small-town dealers than ever before, and the distributors found it a valuable aid in selling cars in large lots, and in bringing the out-of-town dealers into closer contact with headquarters of their cars in the cities around the bay.

A number of Oakland dealers, exhibitors in the big show, as well as some who did not exhibit, due to the fact that they could not obtain space in the auditorium, held exhibitions in their own show rooms, giving the opportunity for



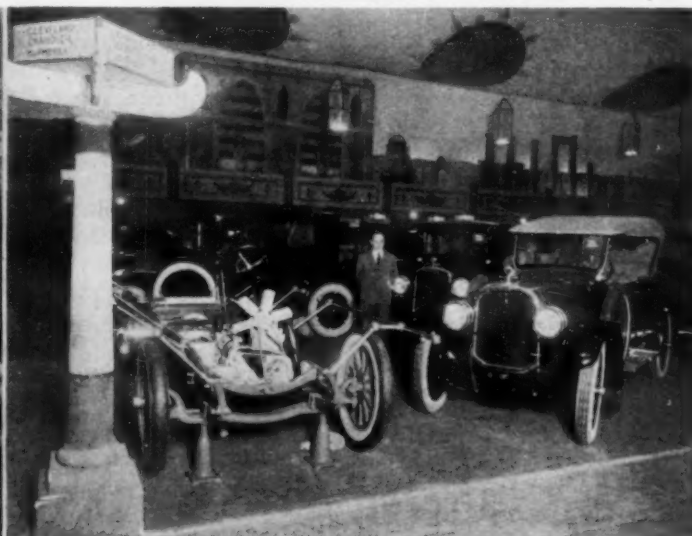
The Alemite booth featured large photographs showing how to apply spring covers, and how to lubricate cars. "Every car built today is a ten-year car if it is kept properly lubricated" was the slogan of this exhibit

sales talks to individuals and to smaller parties of prospects than could be had in the big show. This proved a good sales feature, and dealers in San Francisco will continue it while the big Pacific Automobile Show is on in the Exposition Auditorium at San Francisco next month.

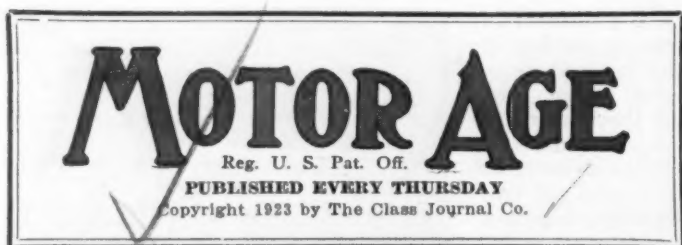
The committee which handled the Oakland show, and to whose efforts is due the success of the exhibition, consisted of some of the best known motor car dealers in the cities on the mainland side of San Francisco Bay. Howard B. Rector, president of the motor car dealers' division of the Alameda County Automobile Trade Assn., was chairman of the show committee, and with him were Willard L. Webber, manager of Don Lee, Inc., in Oakland; Charles L. Hebrank, of Hebrank, Hunter & Peacock; Hal W. Beard, manager of the J. E. French Motor Co.; Harold D. Knudsen, head of the company bearing his name, and Robert W. Martland, secretary manager of the California Automobile Trade Assn., manager of the show.



Harold D. Knudsen, Chevrolet dealer, drew the eyes of all the women with a touring car painted in old ivory



Hebrank, Hunter & Peacock Company showed a stripped chassis in Their exhibit of Chandler, Clevelands and Hupmobiles



Vol. XLIII

Thursday, February 1, 1923

No. 5

## THE CLASS JOURNAL COMPANY

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### SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$3.00 per year
Canada.....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies.....	35 cents

Subscriptions accepted only from the Automotive Trade

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.  
 Entered as second-class matter Sept. 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.  
 Member of Associated Business Papers, Inc.  
 Member of the Audit Bureau of Circulations.

## The Transportation Store

AT the recent highways convention in Chicago one of the speakers said in effect:

There was a time when the automobile manufacturer thought he had accomplished an end when he made a vehicle.

There was a time when the purchaser of an automobile thought he had bought something.

There was a time when the highway commissioner thought that he had reached an end when he had created a good road.

Now we have all learned that we are merely a means to an end. The automobile is nothing in itself. The highway is nothing standing alone. Both are the means to transportation.

This is in line with what MOTOR AGE has been preaching for a considerable period. That the automobile dealer should not regard himself as a seller of vehicles but as a transportation merchant. His goods are of no value except as they are used for transportation and he should endeavor to sell transportation—which of course means maintenance as well as vehicles.

Also this transportation merchant should sell the kind of transportation the people want. If it is motorcycle transportation, sell that to them. If it is motor boat transportation, sell that to them. If it is freight transportation, sell that to them. Also sell them the maintenance and the

accessories that make this transportation safer, more economical and more comfortable.

In the smaller cities, a transportation merchant especially needs to sell all sorts of transportation if he is of value to his community. In the larger cities, there will be many special stores. The merchant should always respond to the needs of his community.



*Study the problems of the man who buys.*



## The Chicago Show

THE Chicago show started as a selling show. The dealers and salesmen on duty at the show expressed astonishment at the interest the visitors who came into the show during the first hour manifested in details and prices of their wares. Also the quickness with which these visitors filtered into the exhibits and began to talk seriously. The roster of prospect names gathered on Saturday was an amazingly large list. There is a lesson for dealers everywhere in the way some of the Chicago dealers are handling the show prospects. Very few of the companies can show in their exhibit spaces all of their models of cars. So these dealers are maintaining a passenger service from the show to the salesrooms and any person who wants to see the complete line is taken to the salesroom, which incidentally means a demonstration ride. This is very good salesmanship, especially when the salesman who takes the prospect from the show to the salesroom assures this prospect that he will be brought back to the show and can continue his sight-seeing.

The special significance of the Chicago show at this writing appears to be that a considerable percentage of the public is hungry for new cars and that selling is going to be good if the dealer watches his used car valuations. If he does not, the good demand of this year is merely going to hasten his demise.



*Fair prices and honest work will make maintenance pay.*



## Exaggerated Maintenance

THE Sperry family lived in a small town, and like people in all small towns they eagerly scanned the daily paper and read every word on both sides of it. They accordingly missed none of the harrowing details vividly described when the West Coast Limited scattered five people down the track and made a junk pile of a new car.

The Sperry family had for a long time husbanded their resources with the earnest intention of buying a car. Up-keep and incidental expenses had been investigated and the step seemed to be one that could be reasonably undertaken. Maintenance facilities of the local dealer seemed to be unexcelled and the brightly painted service car, often seen on the street, seemed to say "We are ready to help you if you ever get stuck."

Vivid descriptions of accidents and destruction are so frequent in the daily paper that the incident at the crossing, while striking nearer home than usual, had also passed out of mind. The details, however, were forcibly recalled with renewed emphasis when a visit was made to the local dealer with the idea of ordering a car. While the coroner had been busy with the human cargo, the brightly painted service car had gathered the



mechanical fragments and deposited them in a grewsome pile at the rear of the shop. The Sperry family got no farther. They looked at the wreck, thought of the possibilities of owning a car, turned and quietly went back home.

A tarpaulin spread over the mechanical remnants would have covered this mute evidence of owner carelessness and stupidity. It would also have saved the sale of a car. Advertising maintenance facilities is all right when it inspires confidence but like many things it can be carried too far.



*You are going to use the flat rate some day, why not start now?*



## National Shows

**I**N recent issues MOTOR AGE has maintained a somewhat interesting discussion of the most profitable period for show dates, referring especially to the National Automobile Shows, as it was believed that these shows, to a very great extent, govern the dates of the lesser shows. In this discussion some very interesting points were raised, not the least of which was the reason for a show at all.

Now comes Norval A. Hawkins, of the General Motors Corp., and questions the advisability of a national show. The recent New York show is the text of Mr. Hawkins' remarks. Unfortunately, in his communication, which was printed in a recent issue of MOTOR AGE, Mr. Hawkins is not sufficiently detailed in some of his statements to make clear his meaning.

Apparently this view of the New York show is based primarily on the supposition that this is a dealer show. It may be true that some persons hold that this objective is still the main point in holding a show, but MOTOR AGE has believed for a number of years that the public interest is the paramount interest and that there is a vast deal of benefit to the motor car industry from focusing the attention of many people on the products of the industry for a week or more.

The pushing of the dealer interests at the New York show is a question for the various salesmen to answer from the results they obtain at these meetings. Judging from reports that are given to MOTOR AGE from time to time, these results are in a very large measure up to the ability of the salesman to adapt himself to the situation that is before him. Some salesmen get good results at shows, others do not.

Mr. Hawkins also is quite critical of expensive dinners and cabarets which he says are unnecessary to obtain the consent of dealers to sell a reputable line of cars. In this stand, Mr. Hawkins has come strongly to the support of the Class Journal papers, which have long advocated that there was a right and wrong way to conduct dealers' dinners and that many of them were conducted the wrong way. The writer attended one dealer dinner in New York which was almost a model of a dealer function. There was no waste, no distracting diversions, but a lot of honest to goodness business talk and some direct and encouraging pledges from the factory folk to the dealers there assembled.

In the place of a show of cars gathered in one building, Mr. Hawkins suggested a show week in which each make of cars is shown in the dealer's place of business. This is not a new idea, but a very, very old one as things go in the automotive industry. The idea is a fine one but the public does not get interested in it. In other words, the operation has been a success, but in each case the patient has died.

There is another feature of the two National shows that may be worth considering. That is the annual reunion and the spirit of humanity that comes with the foregathering of many men of single interest. It seems to a long time observer of these shows that there is much of good in this. There are few men who are mere working machines. Most of them have an interest in men engaged in the same line of work. They feel better after meeting competitors and talking with them. We think the national gatherings in the east and in the west are worth considering, even if only from this standpoint.

As to a fixed national show! Many industries have tried such expositions.



*Proper equipment is a great labor saver and a profit builder.*



## Tire Prices

**T**IRE prices are advancing and in several cases where the advance to the public has been 10 per cent or higher, the advance to the dealer has been only half of that rate. This means that the factories are giving the dealer an additional spread in an effort to help him to make some money during the coming year.

The next question is as to the number of dealers who will take advantage of this opportunity. In the past many, many tire dealers have thrown away their profit by cutting prices. It made no difference how much margin the factory gave to them under the advertised list prices, they merely cut the advertised list prices because some customer came along and told them the man in the next block was cutting prices.

It requires some intelligence to make money in any merchandising business and any merchant who will believe any stranger who comes along the street and tells him evil reports about other dealers, is lacking in intelligence. Instead of investigating these reports as to price cutting, the tire dealers have with one accord cut their own prices to meet the often imaginary cuts elsewhere, and then have demanded a greater margin from the factory to permit them to make a profit.

Now they have an opportunity to cut prices even more without going broke, or to make money. It will be interesting to see what happens.



*Good advertising is a part of good merchandising.*



## The Show and the Dealer

**T**HE show is just what the dealer who participates in it makes it. If he goes to this show believing that it is a waste of time, probably it will be a waste to him.

This dealer will gain much more from his show if he goes there believing that it is an opportunity and that he is going to make the most of it.

This dealer must also convince his salesmen that the show is an opportunity for them to make money. If they go there believing that the show is a vacation, that is what it will be.

Every show also offers an opportunity to help sell the industry as represented in the community to the rest of the business community. This opportunity should not be overlooked.

A show should never be regarded as an opportunity to make money because of the admission fees.

# Larger Schedules to Follow Shows

## Industry Is Prepared to Go Ahead After Chicago Exhibit

### Strong Buying Interest Marks Displays at Detroit, Cleveland, Oakland and Other Cities

NEW YORK, Jan. 29—The end of the Chicago automobile show this week will find the industry prepared to go ahead with programs substantially larger than those followed so far this month and greatly in excess of those of a year ago. While there has been no lull in factory operations during the time between the New York and the Chicago shows, the major automobile producers thus far have followed the schedules of early December. With operations conducted on higher levels from now on, production will gradually move forward until capacity is reached some time in March.

Plans for increased activity have been formulated on the basis of returns from the New York show and exhibits elsewhere that have reflected sustained interest on the part of the buying public. The response to the shows has been most gratifying. Following the New York display retail sales in the metropolitan district made a notable advance, and similar results were obtained in other distributing centers, such as Rochester, Buffalo and Oakland, Cal., where exhibits were held.

Interest ran strong at the Detroit and Cleveland shows and may be accepted as the forerunner of active buying in those sections of the middle west. In none of the cities has there been any but the most encouraging sign of brisk business extending to the beginning of summer, at least.

With the passenger car market running strong, increased activity with truck builders is apparent. Factory operations are being speeded up in anticipation of a good demand with the opening of spring. The road builders' congress recently held at Chicago will have a pronounced effect on sales of trucks in that branch of industry. Demand continues strong for rail cars and motor busses.

Along with the other branches in the industry, tire production is making strong advances, not only in preparation for spring demand but to take care of current orders.

### ROY D. CHAPIN PROMOTED

DETROIT, Jan. 26—At the annual meeting of the Hudson Motor Car Co. Saturday, Roy D. Chapin was elected chairman of the board of directors. He had been president for 13 years. Roscoe B. Jackson, who was vice-president, treasurer and general manager, was elected president and general manager. William J. McAneeny, formerly secretary, was made vice-president and treasurer.

## LOCOMOBILE INCREASES PRICES

CHICAGO, Jan. 29—A price change that has been pending for several weeks was announced today by the Locomobile Co. of America, affiliated with Durant Motors. An advance of approximately \$2000 has been made on all models. The company states that "with a rising market for material and labor, we find that we cannot expect to continue our business without re-adjusting our prices."

The new prices are:

	Old Price	New Price
Phaeton .....	\$7,600	\$9,600
Four-pass. open .....	8,600	9,500
Limousine .....	9,150	11,600
Coupe limousine .....	10,500	11,750
Cabriolet .....	10,700	12,200
Sedan .....	11,000	12,200
Chassis .....	6,800	8,600

## Large Attendance at Opening of N.A.D.A. Annual Convention

CHICAGO, Jan. 29—The sixth annual convention of the National Automobile Dealers' Association met at the LaSalle Hotel here today with about 200 members in attendance. President W. J. Brace of Kansas City was in the chair and made a brief address, reviewing the year's work of the association.

F. W. A. Vesper of St. Louis, treasurer, made his annual report, showing that the association closed the year with a balance of more than \$19,000, a gain of \$6000 over last year. The prosperous condition of the association was gratifying to the members, in view of the fact that 1922 was the first year of operation under the "One of a Thousand" membership plan. General Manager C. A. Vane read his annual report.

## West Tennessee Dealers Organize for Defense

### Special Interest Is Shown in Laws Governing Confiscation of Liquor Cars

MEMPHIS, Tenn., Jan. 29.—Initial steps toward the formation of the West Tennessee and Tri-State Automobile Dealers Association were launched at Memphis in January at a meeting of the Automobile Dealers of Memphis at the Chamber of Commerce to combat certain proposed legislation now pending before the Tennessee General Assembly. John T. Fisher was named to draft the plan of organization.

Especially are dealers concerned over the bill to confiscate cars in which liquor is found. This they declare would work a hardship on the conditional vendor. Pending the trial the car would be in storage and through deterioration and storage charges the value of the car might be entirely consumed.

A committee composed of Henry Gillespie, General Motors Corp.; Claud M. Alexander, manager of the Ford plant; Gus F. Schlecht, Dodge Bros. representative, and attorneys of the local association will go to Nashville to appear before the judiciary committee.

### TORONTO DEALERS TO MEET

TORONTO, Ont., Jan. 27—The retail automobile dealer's section of the Retail Merchants' Assn. will hold its annual convention in Toronto on Feb. 14 and 15.

## Cleveland Show in Magnificent Setting

(See story on page 37)





# Michigan Dealers Discuss Used Cars

## Kelly-Springfield Advances Tire Price to Car Factories

### Move Made to Prevent "Original Equipment" Stocks From Competing With Legitimate Dealers

NEW YORK, Jan. 29—In announcing an advance in price of tires to passenger car manufacturers, the Kelly-Springfield Tire Co. uncovered a new policy that is most radical in its nature and the purpose of which is to offset the wide differential between dealer's and manufacturer's cost. It is aimed, the company states, "to correct one of the outstanding evils of the industry by protecting the legitimate tire dealer against the re-sale of tires by car manufacturers and to re-establish the market for spares now supplied by some car makers."

In its statement the Kelly-Springfield company says that during 1923 it will accept no orders for original equipment from passenger car manufacturers except at prices that closely approximate those paid by the tire dealer, who, the company feels, should be protected against a recurrence of a recent condition when, it is claimed, certain car manufacturers, finding themselves overstocked with tires, unloaded their surplus on the market at only a slight advance over the low price they paid, and for a long time made it impossible for a tire dealer to compete with such offerings.

### Protection for Dealer

Feeling that the dealer needs protection, the company therefore will not seek equipment business at the factories but will practically confine its efforts to the sale of pneumatic passenger car tires to dealers. While it will not decline original equipment business from the manufacturer of passenger cars, it will not accept such orders at prices that differ materially from those paid by the tire dealer, and then with the distinct understanding that only four tires shall constitute original equipment.

On large pneumatics, cushion and solid tires for trucks, the Kelly company feels there still is justification for taking business from truck manufacturers for original equipment at prices below those obtained from the dealer because, it feels, the truck field still is comparatively undeveloped; with considerable "spare" business to be obtained—except in the large pneumatic equipment and this is not a general rule—so renewal and service are still important considerations for the dealer.

In its statement the company says: "The Kelly company feels that its product is widely and favorably known and that because of its reputation it need not seek original equipment orders at price so far below that paid by its

dealers that such business, instead of becoming an advantage, works to the detriment of the latter.

"A certain amount of business may safely be taken at cost but when the bulk of operations are made not only at cost but at a loss, as has been the case in some instances, then profits must come from somewhere and the only available source would be the balance of trade—which means that the dealer would have to be charged all the traffic would bear. Obviously, if no loss were sustained, the price to the dealer could and would be lowered. In the end, of course, the charge always is passed on to the consumer, so the public pays."

## Cole Dealers to Give Up Trading in Used Cars

NEW YORK, Jan. 26—Cole dealers have agreed to abandon trading and to close their used car departments, according to a statement made here today by representatives of the Cole Motor Car Co. The decision follows an agreement by the dealers to accept the shortened discount which was made effective by the manufacturer simultaneously with reductions in prices on all models ranging from \$600 to \$1000.

Cole dealers are offering cars to the public at the new prices with the statement supported by the Cole company, that quality is maintained as it was under the higher prices and that the new prices are made possible by decision of the Cole merchandising organization to discontinue accepting used cars in part payment for new. In the new sales plan the company states its belief in the fallacy of the long discount for trading purposes or the special trading discount.

Cole dealers in several cities have given wide advertisement to the no-trading policy, with a resulting impetus in sales, reports to the company state.

### DEALERS TO HIRE APPRAISER

OELWEIN, Ia., Jan. 27—In an effort to establish a standard used car price on any certain car, Oelwein automobile dealers have decided to employ an appraiser to put a value on all cars offered for sale or trade. A slip showing the value of the car as the appraiser values it will be given to the automobile owner. Any car dealer in Oelwein will allow that amount on the purchase of a new car.

### SYRACUSE DEALERS ELECT

SYRACUSE, N. Y., Jan. 27—The Syracuse Automotive Association has elected the following officers: John H. Sickinger, president; M. P. Potter, vice-president; Leon Patchet, treasurer; directors: W. M. Williams, Charles Abel and Henry Kren.

## Hear Talks by Factory Heads on Relation to New Car Sales

### An Individual Problem, Says A.B.C. Hardy—Can Sell As Many New As Used Cars, Says Jordan

DETROIT, Jan. 27—Used cars held the center of interest at the annual convention of the Michigan Automotive Trade Association—not intentionally, for the speakers were listed to talk upon half a dozen varied subjects, but every speech, soon after getting under way, caught up to used cars, and from that point on it became a used-car speech.

A. B. C. Hardy, president of the Olds Motors Works, was scheduled to speak on "The Combined Problem of Manufacturing and Selling." That was used cars. Harry B. Harper, general sales manager of Studebaker, was to talk on "What United Effort Will Mean to Dealer and Manufacturer in 1923." It meant used cars. "The Greatest Industry in the World" was the topic assigned to E. S. Jordan, president of Jordan Motor Car Co. Used cars was a big piece of it.

### Local, Not National Question

What to do with them was left by these three speakers to the dealers as individuals. Hardy said it was a local, not a national question. Averaging Olds business in 1922 throughout the country, he said only a fraction of one sale not involving a trade-in was made by each Olds dealer and that they had had a prosperous year. Every sale might just as well have involved a trade-in, he said. Harper said dealers must learn to handle used cars as individuals of intelligence. Jordan said there would be just as many new car sales in 1923 as dealers can sell used cars.

The meeting brought forth the largest dealer representation from the outlying cities of any former convention. There were 132 at the afternoon session and over 200 in the evening. New officers for the year are W. K. Philp, Grand Rapids, president; Walter P. Staibler, Ann Arbor, vice-president; L. H. Saunders, Detroit, treasurer. Directors re-elected were Walter J. Bomb, Detroit; George L. Simmons, Flint; Frank E. Hathaway, Muskegon; Charles A. Mitchell, Bay City, and H. E. Loomis, Battle Creek.

The constitution of the association is to be amended so that in the future membership will be limited to dealers only. The membership has grown to 300 and Manager W. D. Edenburn expects to extend this to cover the entire State thoroughly within the next year. The sessions of the convention were held at the Hotel Tuller in the afternoon and the Michigan Club in the eve-

(Continued on next page)

(Continued from preceding page)  
ning. The day was also designated Michigan Day at the Detroit show, where the delegates were the guests of the Detroit Automobile Dealers' Association.

At the evening session, Harry B. Harper, speaking as both a factory sales manager and a former dealer, defended factory sales policies in general by saying they were the result of careful investigation and analysis by the best experts obtainable, and were devised fundamentally for the betterment of the dealer. He cited the Ford and Dodge organizations as examples of success brought about largely through adherence to factory principles.

The average factory organization, he said, is much more efficient than the average dealer's, and furthermore, it has the finances to pay experts for helping dealers whom dealers or dealer organizations could not possibly pay. Dealers must match the efficiency of the factory, he said or they were likely to be displaced. Successful factories, he declared, work out policies backward from the point of dealer profits, and know, he said, that a policy, to be successful, must be favorable for dealers.

Factories today, Harper said, were spending more money in building up dealer efficiency than in manufacturing or selling. Too much attention is paid by dealers in thinking about territories other than their own, whereas every bit of thought and study should be given their own. There are more prospects in the average territory about the country, he declared, than the average dealer will sell in a lifetime.

#### Must Run All of Business

As long as dealers are American citizens running their own businesses, they have got to run all their own business. If the factory has to take over used car sales they will have to take over new car sales also. The factory and dealer problem is not to make or sell cars, he said, but to get them into the hands of the consumer. The factory job is to sell the consumer through the dealer as an intermediary. Trade allowances make bad habits, he said, because they have to be cut off sooner or later and dealers who once get used to them can't get along without them.

The manufacturer who is most successful in selling goods to the public in 1923 will be the most successful manufacturer and will have a successful dealer organization.

Hardy told dealers to stick to a sane policy on used car valuations as individuals and it would become a well regulated part of the business of selling cars, which it is bound to become some day, anyhow. Dealers who do not trade sanely, he said, will eliminate themselves, and the quickest way to eliminate them is to send them all the trades that come along. The automobile business today, he said, is a buying business, and the dealers who are the best buyers will be most successful.

The Olds branch at Lansing, he said,

## Many Sales Made on Floor At Baltimore's Big Show

### 48 Exhibitors Display 57 Makes of Cars—380 Maryland Dealers at Meeting

BALTIMORE, Jan. 27—Viewed from every angle the show staged from Jan. 20 to 27 at the Fifth Regiment Armory, Baltimore, by the Baltimore Automobile Trade Assn., was the most successful ever held in this city. Despite some rather bad weather the large auditorium was crowded every night and there also were good crowds on hand during the afternoon. On Tuesday, the third day of the show, all previous records for paid admissions to an event of its kind in Baltimore were shattered. It is estimated that about 10,000 persons saw the exhibits on that day.

Tuesday afternoon also was an important one for the dealers. All the Maryland dealers were invited to be the guests of the association staging the show. A total of 380 attended. They heard stirring addresses by former Governor Phillips, Lee Goldsborough and Ray W. Sherman.

A total of 48 different exhibitors made up the automobile section of the show, and they exhibited 57 different makes of cars. John E. Raine, secretary of the association and manager of the show, and the others on the committee have been highly complimented for the excellent showing.

This year's show is regarded as the best business getter that has ever been held in Baltimore. Many dealers reported making some excellent sales on the floor.

is under direct factory control and is a successful company. It is always a steady profit producer at all times except when some competitor starts trading at prices the branch won't meet. Then it just stops selling until the competitor gets sane or goes out of business. He disparaged any national way of handling used cars and said dealers must do this locally. Factories cannot combine, he said, to restrain output, as has been suggested in some quarters.

Jordan described by charts the features that make for improved business. The test of a car, he said, is its value at the end of the first, second and third year of use. Cars that have been built right and have been serviced properly during their operation have high resale valuation. Unless they have, dealers cannot afford to sell them or accept them in trades.

#### HEADS MILWAUKEE TIRE DEALERS

MILWAUKEE, Wis., Jan. 26—M. L. O'Brien, head of the O'Brien Tire Co., 526 State Street, Milwaukee, was elected president of the Milwaukee Tire Dealers' Association at the annual meeting. Edward Netz of the Wauwatosa Tire Co., a suburban concern, was chosen first lines are operated in the state.

vice-president, and Gustave Keller, of the Keller Tire Store, second vice-president. Sam Rowe, of the Republic Supply & Rubber Co., was re-elected secretary-treasurer. He also is secretary-treasurer of the Wisconsin state association. Henry O. Stenzel, of the Milwaukee Tire & Supply Co.; George Burmeister, H. C. Graham and H. A. Ruhnke were elected directors. In order to support a drive for an increased membership, annual dues were reduced from \$60 to \$25. The association went on record as unqualifiedly supporting the policies and aims of the national association as enunciated at the recent national convention held in Milwaukee.

#### FT. WAYNE COMMITTEES

FORT WAYNE, Ind., Jan. 25—Committees for 1923 have been named by the executive committee of the Fort Wayne Auto Trades Association as follows by President A. L. Randall: Entertainment, Clarence Miller, O. L. Krauss and Roland Fitch; membership, Earl Moss, LeRoy Gale, L. J. Andrews; ethics, C. H. Lines, W. H. Wallace, C. B. Hayner; legislature, Ward S. Becker, C. L. Bornschein, Chester Schiefer; show, Chester Schiefer, John Pennell and William Hanke; publicity, Albert Poinsette, John Goehrginger and F. W. Webber.

The association is planning to establish a blue book to be used in connection with the sale of used cars. The book will give the approximate value of used cars and will provide uniform prices.

The legislative committee will meet in the near future to frame a bill providing a more severe penalty for illegal automobile conversion. It is planned to have the proposed law placed before the state legislature.

#### SCHOOLER DES MOINES HEAD

DES MOINES, Ia., Jan. 27—At its annual meeting, the Des Moines Automobile Dealers' Association reelected Dean Schooler, president. Schooler has been president of the organization and one of the managers of the Des Moines show since its inception. Clyde L. Herring was elected secretary and the following new members of the board of directors were named: J. A. Peverill, G. W. Orr, Don Laster.

#### CARLISLE PLANS SHOW

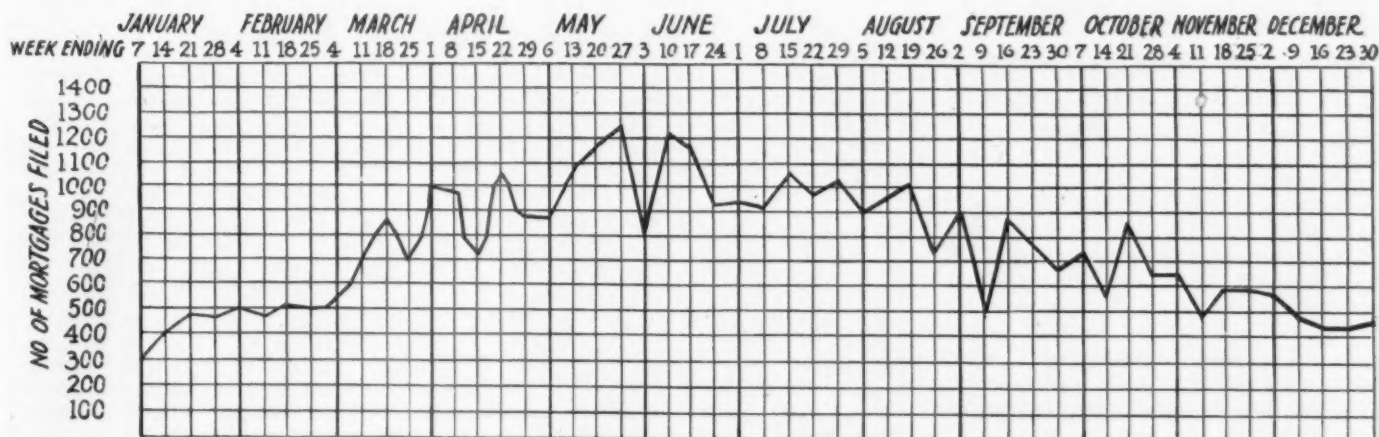
CARLISLE, Pa., Jan. 25—The Chamber of Commerce is planning an automobile show in the gymnasium of the Medical Field Service School, in connection with Army Demonstration Week at Carlisle Barracks, March 5 to 10, inclusive. Both passenger cars and trucks will be displayed and all car dealers in Carlisle and vicinity will take part.

#### 160 TENNESSEE BUS LINES

NASHVILLE, Tenn., Jan. 27—A recent survey of bus lines operating in Tennessee, compiled by the division engineers of the highway commission, gives data showing that more than 160 bus



Table Showing Time Payment Sales in Chicago



### Finance Records Show Sales for 1922 in Chicago

CHICAGO, Jan. 26—Records compiled by the Central Automobile Financing Assn., with headquarters in Chicago, present a complete picture of the trend of automobile sales in Cook county, including the city of Chicago, throughout 1922. The figures are based on the retail sales on the time payment plan and represent approximately 70 per cent of the total sales. The first week of the year showed the smallest sales of any week, the figures for the week ending Jan. 7 being 302 sales.

Sales gradually increased throughout the winter and spring, the biggest spurt coming at the end of March, when a total of 1003 sales for one week were recorded. The weekly figures remained near the 1000 mark until the end of May, when another spurt was recorded, the total sales for the week ending May 27 being 1261. This was the high week of the year. One other week exceeded 1200, the figures for the week ending June 10 being 1248.

Sales remained fairly steady around the weekly mark of 1000 until toward the end of August, when they began to decline perceptibly. The first drop below 500 came early in November, but there was a recovery to near 600. In December, however, there was another slight decline, the figures for the last four weeks of the year being as follows: Dec. 9, 487; Dec. 16, 435; Dec. 23, 458; Dec. 30, 454.

### PEERLESS PLANT ENLARGED

CLEVELAND, O., Jan. 29—Big additions are being made to the plant of the Peerless Motor Car Co. in this city, in anticipation of another year of big business and to enable Peerless craftsmen to take even more painstaking care in building cars. Ever since R. H. Collins and his associates took over the management of the corporation it has been the plan to provide more space for, and more time to, the various operations. The plant alterations and additions are adding approximately 50,000 sq. ft. of working space.

### ASKS FOR REPUBLIC SALE

DETROIT, Jan. 27—Application will be made in Federal court Jan. 29 by the Security Trust Co., receiver for Republic Motor Truck Co., for an order to sell the property. If the order is issued it is expected that the sale will be held soon after March 1. Though there is no definite movement at this time for a reorganization of the property, the receiver expresses confidence that because of the present good condition of the property and the steady flow of truck business, a sale can be successfully held. Business is now running at the rate of 60 to 75 trucks monthly, the receiver declares, with no efforts at sales promotion.

### DEALERS HOLD A CLINIC

CHARLOTTE, N. C., Jan. 27—A service clinic was held here for two days last week by C. C. Coddington Co., distributors of Buick cars in the two Carolinas. About 75 foremen and managers from Buick distributing centers on the territory attended the clinic. Among those addressing the clinic were William H. Alexander of the Marcel Carburetor Company; President Smith of the Service Station Equipment Company; A. H. Sarvis of the Buick service department; B. H. King, district sales manager from Flint; Lee A. Folger, vice-president of the Coddington company, and B. C. Scott of the Coddington company.

### MICHIGAN GAS TAX BILL

DETROIT, Jan. 27—Representative Warner of Ypsilanti has introduced a bill into Michigan legislature providing for a law to collect a tax of two cents a gallon on all gasoline sold in the state of Michigan, the tax to go for road building and road maintenance. Warner expects this bill to produce \$9,500,000. Warner would collect all the money at the refineries and use the funds to retire the bonds which were voted four years ago for \$50,000,000 for road building and road maintenance. The bill has been referred to the committee on taxation and will probably not be taken up before Feb. 15 or March 1.

### Dealers Distribute "Please Be Careful" Stickers

ST. LOUIS, Jan. 29.—As part of its campaign to make automobile driving safer in St. Louis, the St. Louis Automobile Dealers' Association has issued to all dealers large quantities of windshield stickers bearing on the side visible from in front of the car the admonition, "Please Be Careful." On the other side of the sticker, so the driver may see and read, is a diagram showing the proper use of hand signals, and the following list of safety suggestions:

Imagine the driver of the other car is your father.  
Pedestrians have rights on the streets.  
Over five miles per hour at schoolhouses is unsafe.  
Railway trains don't stop at crossings.  
Never pass a street car unloading passengers.  
Twenty-five miles is the top limit; 15 is safer.  
Turn long to the left; short to the right.  
Don't pass another car on its right.  
Sound horn and slow down at all crossings.  
Have your brakes adjusted often.  
Get a windshield wiper and use it.  
Skid chains may prevent collisions.  
Don't drive in the middle of the street or road.  
Stop at all boulevard crossings.  
Dealers put one of these stickers on every car they buy and on every car they sell.

### EYE TEST DEMANDED

CHICAGO, Jan. 27—Members of the American Optometrical Association in convention here this week went on record in favor of legislation that would require automobile drivers to pass an eye test before being granted licenses. The optometrists claimed many accidents are due to impaired vision.

### GILMER INCREASE IS 60 PER CENT

PHILADELPHIA, Jan. 27—Sales of automotive products by the jobbers' division of the L. H. Gilmer Co., this city, manufacturers, showed an increase during 1922 of 60 per cent over 1921. Indications are that business in this department for 1923 will double that of 1922.

## Ford's Largest Year's Sales Well Distributed Through U.S.

### Only Sections Falling Below Mark Were in Few Middle West Grain Growing States

DETROIT, Jan. 27.—Retail sales of Ford cars and trucks in 1922 were largest in those territories served by assembly branches in the eastern section of the United States, the highest individual total being made by the Kearny plant in the New York district, with 86,508. Chicago with 75,228 was second, with Detroit, Philadelphia and Kansas City next in order. Kansas City led in tractor sales with 9288.

The sales totals for the year in each of 28 assembly branches in the United States, according to factory compilation, and with the month of December estimated, is as follows:

	Cars and Trucks	Tractors
Atlanta, Ga. ....	29,520	4,152
Buffalo, N. Y. ....	47,508	6,096
Cambridge, Mass. ....	56,760	3,252
Chicago, Ill. ....	75,228	6,888
Cincinnati, Ohio ....	27,912	3,180
Cleveland, Ohio ....	38,376	3,888
Columbus, Ohio ....	33,192	4,212
Dallas, Texas ....	39,888	5,160
Denver, Colo. ....	24,324	2,688
Des Moines, Iowa ....	33,264	5,100
Detroit ....	68,736	6,888
Houston, Texas ....	38,892	4,056
Indianapolis ....	38,784	4,860
Kansas City, Mo. ....	60,048	9,288
Los Angeles, Cal. ....	37,044	2,700
Louisville, Ky. ....	26,676	3,048
Memphis Tenn. ....	33,024	2,640
Milwaukee, Wis. ....	41,892	5,136
Minneapolis, Minn. ....	48,276	7,068
New Orleans, La. ....	28,632	3,456
New York, N. Y. ....	86,508	4,992
Oklahoma City, Okla. ....	35,676	4,188
Omaha, Neb. ....	30,576	3,060
Philadelphia, Pa. ....	60,408	4,308
Pittsburgh, Pa. ....	35,388	2,160
St. Louis, Mo. ....	42,168	5,352
San Francisco, Cal. ....	35,412	4,716
Seattle, Wash. ....	20,388	2,556

Sales at the six service branches in the United States from which cars are distributed but which do not assemble, were as follows:

	Cars and Trucks	Tractors
Charlotte, N. C. ....	42,504	5,268
Fargo, N. D. ....	21,384	4,584
Jacksonville, Fla. ....	19,296	2,244
Portland, Ore. ....	14,748	1,584
Salt Lake City, Utah ....	10,104	1,224
Washington, D. C. ....	23,820	2,112

Territories covered by the assembly and service branches are immediately adjacent to the cities in which located but are not confined by State lines. In some instances states are divided among several branches and in others three or four states are served by one branch. The Houston branch serves most of Mexico with the Los Angeles branch serving the Pacific Coast Mexican states.

The remarkable feature of the year's business, officials said, is that distribution has been evenly balanced in practically all sections, no one district failing to reach marks commensurate with former totals. Increased business was largest in the east and the industrial sections west of the Mississippi and north

## 1922 Production Was 2,577,220 Cars and Trucks, According to Revised Figures

WASHINGTON, Jan. 27.—Revised figures of the Census Bureau for the month of December place the automobile production at 226,556, consisting of 206,418 passenger cars and 20,138 trucks. This is almost three times the December production of 1921.

The total output for the year 1922, subject to slight revision on final reports, amounted to 2,334,171 passenger cars and 243,049 trucks, compared with passenger car production of 1921 of 1,435,161 and 147,000 trucks, according to Census Bureau figures.

The growth of the automotive production during the past year in comparison with the previous year is shown by the following comparative figures for the last six months of each of the two years:

	Passenger Cars		Trucks	
	1922	1921	1922	1921
July .....	224,770	165,574	21,739	10,766
August .....	248,118	167,705	24,420	13,080
September .....	187,637	144,669	19,173	13,648
October .....	216,099	134,734	21,466	12,813
November .....	214,632	106,042	21,627	10,010
December .....	206,418	70,690	20,138	8,307

of the Ohio river. There was a slight falling off in the grain states of the middle west, the northwest and in some districts in the south.

Canadian business by branches was as follows:

	Cars and Trucks	Tractors
Calgary, Alta. ....	1,979	-----
Regina, Sask. ....	2,407	-----
St. John's, N. B. ....	2,093	64
Vancouver, B. C. ....	1,900	34
Windsor, Ont. ....	2,428	157
London, Ont. ....	3,976	174
Toronto, Ont. ....	11,462	318
Winnipeg, Man. ....	3,003	112
Montreal, Que. ....	6,226	109

### FORD OPERATING PLAN

DETROIT, Jan. 26.—With the completion of a series of purchases which gives it control of large coal producing properties, Ford Motor Co. is working out a plan of operations which will give it an excess over requirements for its own needs, and in compliance with the established policy of the company will offer the excess to those manufacturing companies from which it buys parts, equipment and material.

Officials declare that the company has no intention of entering the coal business, but that the economic operation of its coal fields will yield a supply over its own needs and this supply will be sold. The excess will not be sufficient to meet the needs of more than a small number of its supply sources, it was declared, so that there will not be a turnover for the general market.

### STREET LINES USE BUSES

SPRINGFIELD, Mass., Jan. 25.—Street railway companies in this section are using motor busses to an increased extent as an auxiliary. The latest departure in that direction is the purchase by the Springfield Street Railway Co. of two busses for a service across the new bridge connecting this city with West Springfield. The Holyoke Street Railway Co. and the Connecticut Valley Street Railway Co. have operated motor busses for several years past. The Springfield company is being urged to put on an extensive system of feeder bus lines.

## 30,000 Attend Business Getting Show at Rochester

ROCHESTER, N. Y., Jan. 27.—With a last day attendance of 7,500, breaking all records for paid admissions, the fifteenth annual automobile show of the Rochester Automobile Dealers' Association was brought to a close here last Saturday night. It was 11 o'clock before the eleventh hour dancing crowd could be convinced that it was time to go home and call the 1923 show at an end. At 11:15 Manager Frank W. Peck switched off the lights for the last time, called a taxi and made a dash for the railroad station to catch the midnight train for St. Petersburg, Fla., where he will take up his interrupted winter residence with his family.

Twenty-one thousand paid admissions to the show had been received up to the closing day and the final day swelled this total to close to 30,000. When it is remembered that this was the first year there had not been thousands of free admission tickets, through the distribution of passes by the dealers, that figure presents a record. With more than 30,000 free tickets alone, the largest previous attendance on record was 48,000.

From the standpoint of sales this year's show has broken all records. In many other respects, too, it has surpassed any previous record of Rochester dealers. More different models than ever before were shown by the dealers while there was more genuine interest shown by the public.

### ROCKFORD ELECTS

ROCKFORD, Ill., Jan. 26.—At the annual meeting of the Rockford Automotive Dealers' Association, officers were elected for the coming year as follows: President, Charles Geng; vice-president, W. H. Williamson; secretary-treasurer, C. W. Williams. It was voted to stage a winter show of cars, providing an adequate building could be secured. Murray Bird was appointed chairman of a committee to make a report in relation to available structures.



## Merger of Speedways in California Is Planned

### Cotati and San Carlos Bowls to Be Abandoned for One at Hayward

SAN FRANCISCO, Cal., Jan. 29—Consolidation of all the automobile speedway organizations and their supporters into one corporation, which is preparing to build one great speedway at Hayward, as soon as the rainy season ends, is announced here by J. Francis O'Connor, president of the company which operates the speedway at Cotati. The consolidation was announced following several conferences between the representatives of the owners of the Cotati and San Carlos bowls—the latter of which was heavily damaged by fire a few months ago and has not been rebuilt—and the interests represented by R. C. Durant, of Oakland, who has put a racing team in the field this year.

According to O'Connor, the new corporation will be capitalized at \$250,000, and it will commence construction of the Hayward bowl early in May, or sooner, if the rainy season ends before that month. The track, according to present preliminary plans, will be a mile and a half around, with a 1250-foot straightaway, and will be of the wooden bowl type supported by earth embankments. The Cotati speedway, and what remains of the San Carlos bowl, are to be torn down and the resulting \$50,000 to \$75,000 worth of lumber will be used in building the new and larger bowl, in which it is planned to hold all the automobile races held in northern and central California hereafter.

In the conferences which led to the merger, the San Carlos interests were represented by Christie Loesser; the Oakland interests by R. C. Durant, who is to be president of the new company, and John S. Prince, builder of both speedways; while the Cotati interests were represented by J. Francis O'Connor. Hayward is only a few miles out of San Francisco, and is connected by rail lines and paved highways with all parts of northern and central California. Its location is such as to offer the greatest opportunity for maximum attendance at all the automobile races. The entire capitalization of the merger is to be spent on the new bowl.

### U. S. COURT UPHOLDS GAS TAX.

SAN FRANCISCO, Cal., Jan. 29—The right of a state to enact legislation providing for the imposition of a gasoline tax was upheld here when, late in January, the United States Circuit Court of Appeals affirmed a judgment in favor of J. W. Walker, state treasurer of Montana, in an action brought by the Continental Oil Company of that state. The decision is of particular importance at this time, as it is very probable that the state legislature, now in session, will

put a tax of one to two cents a gallon on all gasoline sold in California.

The case in which the decision was rendered was instituted for the recovery of \$13,058.74, paid to the state treasury of Montana, and which is stated to have been equivalent to a tax of one cent a gallon on all gasoline sold by the Continental company. The United States District Court of Montana sustained a demurrer filed by the attorney-general of that state, which in effect was a nonsuit of the action brought by the Continental Oil Company, which thereupon carried the matter to the United States Circuit Court of Appeals sitting here.

## Employees Hold Own Traffic Court

MINNEAPOLIS, Jan. 26—Standard Oil employees in Minneapolis hold traffic court every Tuesday afternoon in the general offices. Every member of the organization must appear who figures in a traffic accident. The jury is made up of representatives of every other department than the one from which the "prisoner" is taken. A tank driver who avoidably knocked a flower pot off a wall backing down a driveway in the residence district was found guilty and sentenced to work two Sundays without pay. Appeals are made to the manager, who is a member of the court ex-officio. The court has cut down accidents involving employees 75 per cent since October.

### BREAKDOWN FOILS THIEF

CHICAGO, Jan. 27—A thief who recently made way with a new Cunningham car which was being demonstrated to him by a salesman in Chicago was arrested at Quincy, Ill., when he undertook to have the car repaired. It was necessary to order some parts from Chicago to repair damages the car had received in an accident and this gave the clue which led to the arrest. He gave his name as Arthur Arnold Simpson, 20 years old, and said he was employed as a garage mechanic.

### MOTOR WHEEL BUYS FORSYTH

CHICAGO, Jan. 27—The Motor Wheel Corp. of Lansing, Mich., has further extended its automobile wheel business by the purchase of the Forsyth Bros. Co., Harvey, Ill., manufacturer of Forsyth steel wheels. The Motor Wheel Corp. also recently purchased the Distel steel wheel business of the Detroit Pressed Steel Co.

### NEW MOTOR CLUB HEAD

CHICAGO, Jan. 27—Frank E. Jack, for a number of years treasurer of the Chicago Motor Club, has been elected president of the club, to succeed Charles M. Hayes, who resigned because of ill health. It is said that Hayes is a patient in a sanatorium.

## December Second Best Month For Car Sales in California

### New Registrations Only Slightly Below Those of November and Double Those of Year Ago

OAKLAND, Cal., Jan. 29—Automobile sales for December throughout California showed the record month of the industry in this state, with the exception of November, 1922, which exceeded December by 402 sales, though December, 1922, sales were 99 per cent larger than those registered for the same month of 1921. According to "Motor Registration News" of this city, which has made a state-wide survey of the industry and its merchandising in December of last year, passenger cars kept their lead in percentage of increase over that of the trucks. In December, 1921, the Motor Vehicle Department of California registered 7559 passenger cars, while in December, 1922, there were 15,409 registered, an increase of 7850 sales, or 103 per cent.

Though lower in percentage of increase than the passenger car sales, the motor truck business of the state shows a wonderful increase. In December last, 1554 trucks were sold in California, as compared with 928 in December, 1921, a gain of 626 sales, or 67 per cent. Taking these totals of both branches, sales for December, 1922, were 16,963 cars and trucks, or 8476 more than in the same month in 1921, an increase of approximately 99 per cent.

The percentage increase record also moved from southern California to northern California, in December last. There are 47 counties in what is known as northern California, and 11 counties in the section of the state south of the Tehachapi Mountains. In November, the percentage increase went to southern California by a four per cent margin, while in December the north shows a 20 per cent margin in percentage gain on sales over the southern counties. The northern section made a gain of 112 per cent on sales in December, 1922, over those of December, 1921, while the southern counties showed only 92 per cent gain in sales for the same two months. In northern California, the passenger car sales made the remarkable gain of 114 per cent for December, 1922, over those of December, 1921. Truck owners in the north also increased notably, there being 599 new trucks registered in December, 1922, as compared with 320 a year before, in this section of the state. The advance in the commercial vehicle field was thus 279 trucks, or 87 per cent better than in December, 1921. In southern California, truck sales show a 57 per cent gain for December last over the same month a year ago. There were 955 trucks sold in southern California during the last month of 1922, as compared with 608 sold there in December, 1921, an increase of 347 sales.

## Milwaukee's Biggest Show Viewed by 80,000 Persons

**Intense Interest Shown at Fifteenth  
Annual Exhibition Conducted by  
Dealers' Association**

MILWAUKEE, Wis., Jan. 27—Judging by dealer as well as consumer interest manifested in Milwaukee's fifteenth annual show which closed tonight after an 8-day run, Wisconsin is due to duplicate if not excel the record-breaking absorption of passenger cars accomplished in 1922, when 46,203 new cars were placed in owners' hands. Predictions were freely made on the final day of the exposition that 1923 registrations will show a net gain of more than 55,000, with some enthusiasts asserting their belief that possibly 60,000 will be the ultimate figure.

This year's show was a tremendous success from every viewpoint. All past attendance marks were exceeded, making it an undoubted financial success for the Milwaukee Automotive Dealers' Association, which has sponsored 14 out of the 15 shows held here. The original show in 1908 was promoted by the Milwaukee Automobile Club, which recognized that an exposition of this kind belonged to the trade rather than a social organization of owners, and relinquished all rights to the dealers after having given the show idea a successful introduction.

From the standpoint of the distributor and dealer, the show is a big business proposition, vying in importance with the consumer phase. Milwaukee is the great jobbing center for Wisconsin and Upper Michigan, in all lines of trade. This is particularly true in the automotive industry. The Milwaukee Automotive Dealers' Association has a membership of about sixty-five, nearly every one of whom is distributor of his line or lines for the state and peninsular territory, as well as being the retail dealer in Milwaukee city and county. This combination of interests forms the background



of a dual community of interest in the annual show.

Approximately 80,000 persons visited this year's show, an average of 10,000 a day. Former shows usually have been opened on a Thursday evening and run until the following Wednesday night. This year the show opened on a Saturday night and closed on the following Saturday night, giving the usual one Sunday, and two Saturdays to make attendance convenient, especially by those living at distances from Milwaukee.

There are 2,150 registered dealers in Wisconsin, and about 500 in Northern Michigan, and it is conservatively estimated that over half of this number sent representatives to the show this year. The annual meeting of the Wisconsin Automotive Dealers' Association on Wednesday of show week made this the biggest day of the exposition so far as dealer attendance was concerned.

Talks with a large number of out-of-town dealers reveal that they uniformly believe their city market is at least as good as it was during 1922, despite the heavy purchases last year, while the farmer market is far and away broader. In fact, many upstate dealers already have laid campaigns directed at the rural communities, which while not neglected last year, did not respond so well to sales appeal as city folk.

A new feature of show activity was the creation of a secret committee which was at work every day to determine "the best salesman." The judges essayed the role of prospects and unbeknown to the salesmen judged them on the basis of courtesy, tact and selling ability. A cash award of \$25 was made to the salesman who each day was voted to be nearest the ideal. No winner was eligible for an additional award.

## Court Orders Tire "Maker" to Stop Use of Racine Name

WASHINGTON, Jan. 27—Orders have been issued by the Federal Trade Commission to Morris Klein of Chicago to refrain from the use of "Racine Tire Sales Company" as a trade name and also to stop stamping any tire with the name "Multi-Cord."

The cease and desist order was issued after the hearing against Klein, who has been conducting a tire rebuilding and repairing business under the name of Racine Tire Sales Co. The commission found that the respondent sold rebuilt second-hand automobile tires with the name "Multi-Cord" stamped thereon. This practice, the commission found, not only results in confusion to the purchasers with a tire manufactured by the

Racine Rubber Company, known as the "Multi-Mile Cord," but also tends to lend prestige to the respondent's product which does not rightfully belong to it.

## NEGOTIATING FOR ENGINE PLANT

CHICAGO, Jan. 27—Officials of the Yellow Cab Manufacturing Co. and the Chicago Motor Coach Co. announced here that they are negotiating for the purchase of the engine manufacturing plant of the Root & Van Dervoort Engineering Co. at East Moline, Ill. The Chicago Motor Coach Co. has been using in its busses the Knight engines made by the Root & Van Dervoort Company and it is said to desire possession of the plant for the purpose of greatly increasing production. In the event the deal is completed, it is said, the manufacture and sale of the new R & V Knight automobile will be continued by the R & V Motor Co.

## Mental and Physical Tests for All Drivers Demanded

PHILADELPHIA, Jan. 27—The traffic committee of the Chamber of Commerce and representatives of a number of large automobile clubs here have combined to embody in a number of bills soon to be presented to the State Legislature recommendations including mental and physical examination of motor vehicle drivers, traffic courts for cities of Pennsylvania and power to municipalities to impose penalties for violation of traffic regulations.

## INDIANAPOLIS SEAT SALE STARTS

INDIANAPOLIS, Jan. 29—Seats went on sale today for the Eleventh annual 500 mile International Sweepstakes automobile race to be run on the Indianapolis Speedway next May 30.



# Grand Setting for Cleveland Show

## New \$8,000,000 Auditorium Gives Comfort for Visitors

### Thousands Throng Exhibits During the Week—Truck and Tractors in Armory

CLEVELAND, Jan. 27—Automobile dealers of this city brought to a close today a motor car show held under auspices without parallel in the history of the industry's expositions. The new \$8,000,000 Public Auditorium provided a setting for the show which put the Cleveland exhibit in a class by itself as far as appearance and comfort and convenience of the public are concerned.

Not only was there room for large exhibits and spacious aisles on the main auditorium floor and on the so-called exhibition floor in the basement, but there was seating capacity in the auditorium balconies for several thousand people to seek rest from the milling crowds and at the same time see the greater part of the show—all in one look.

Cleveland will not be wondering in future years why it is that people will pay admission to undergo the discomfort that goes with pushing and shoving and being pushed and shoved around an automobile show with never a chance to sit down and get some enjoyment for their money. The balconies and the roomy lobbies provide plenty of opportunity to get away from the throng, listen to the music, which includes the Auditorium pipe organ, and get something more than an impression over some one else's shoulder of the things that go to make up an automobile show.

Cleveland dealers are fortunate to have such a show opportunity as the Auditorium provides, and they made the most of the opportunity. Most likely the novelty of a show in such surroundings would have drawn the crowds, but the trade in Cleveland did other things to make it the biggest show yet, among them the staging of a truck and tractor show in the Central Armory, across the street from the Auditorium. A stub on the passenger car show ticket admitted the visitor to the truck exhibit, which was well attended. In addition, there were numerous automotive equipment exhibits in the Auditorium lobbies and a good education exhibit on growth of the industry and motoring, reduction of automobile purchase and upkeep costs and safety in traffic, staged by the Cleveland Automobile Club with some suggestions from the show management.

The show attracted the largest crowds which ever attended an automotive exposition in Cleveland. As a result of extensive out-of-town advertising, the people came in large numbers from around the state. Immediate re-

tail sales ran strong and promotion of wholesale business, partly through the agency of numerous dealer meetings arranged by distributors and factory officials, was effective.

The truck show, which the commercial transport dealers expected to do no more than stimulate public interest, also produced some sales and a good many prospects. The high light of the truck show was the exhibition by several vehicle and body manufacturers of busses, several of them equipped and lettered to begin service. On the prompting of truck exhibitors, people were seen all the time climbing in and out of the busses, several of them of the de luxe type, with the result that the bus transportation idea was given some good promotion.

The trade rally which always is a feature of the first Monday of the Cleveland show, was attended by about 400 dealers and salesmen and was addressed by David Beecroft, directing editor of The Class Journal Co., and Henry Meixell, secretary of the National Motor Vehicle Conference Committee. At an accessory rally, Ray W. Sherman, merchandising director of the Automotive Equipment Association, spoke, and showed the "Shop Profits" film, and George M. Graham, vice-president of Chandler, talked on the opportunity for 1923 business.

Under the direction of Herbert Buckman, manager of the dealers' association, the show was intensively promoted, and the elimination of free tickets, except on the opening Saturday and Sunday, seemed to have no effect on the crowds, which were ahead of last year's right through the week.

## Norval A. Hawkins Named General Motors Consultant

NEW YORK, Jan. 25—Alfred P. Sloan, Jr., vice-president of General Motors Corp., announced today that, effective Feb. 1, Norval A. Hawkins has been appointed a general consultant, with headquarters in Detroit.

B. G. Koether has been appointed acting director of sales, advertising and service section of the Advisory Staff, with headquarters in Detroit. Koether has been vice-president of the Hyatt Roller Bearing Co. in charge of sales and also assistant general manager of the Hyatt Bearings division of General Motors.

H. Forsythe, president of the Hyatt company, announces that H. A. Brown, Jr., has been appointed general manager of sales for that company with headquarters at Harrison, N. J. He will succeed Koether as sales manager. F. E. Booth has been appointed manager of the Central division of the Hyatt company with headquarters in Detroit, succeeding Brown.

## \$419,722,880 Is Total for Equipment Makers Last Year

### M. A. M. A. Figures Show Great Gains Over Any Previous Record

NEW YORK, Jan. 29—December with sales amounting to \$34,711,630 brings the total amount of business done during 1922 by the manufacturers of automotive equipment up to \$419,722,880, only a little ways off the half billion dollar mark.

These figures, secured from reports received from members of the Motor and Accessory Manufacturers Assn., make the year just ended the greatest in the history of this branch of the automotive industry. Last year was exceptionally good, it was thought, but its total sales of \$238,073,945 look insignificant when compared with the 1922 report.

December, 1922, was a month in keeping with its eleven predecessors, the reports showing that the amount of business done totaled \$34,711,630, a decrease of 5.20 per cent over November but still exceptionally good for a December. In fact it beat every month in 1921. This shows, the interpretation has it, that the equipment business is holding up well and the small decrease may be credited up to a seasonal decline and nothing else.

Members of the M. A. M. A. are almost unanimous in predicting a bright outlook for the first six months of this year. The immediate future, they say, could not be any brighter and there is evidence that many of the car manufacturers have scheduled increased outputs for the next six months that will test the capacity of the equipment plants to fill the orders already placed.

## G. G. G. Peckham Nominated For President of N. A. D. A.

CHICAGO, Jan. 29—G. G. G. Peckham, president of the Ohio-Buick Co., Buick distributor in northern Ohio, and president of the Cleveland Automobile Manufacturers and Dealers Assn., was nominated for president of the National Automobile Dealers Assn. when the annual convention of the organization opened here today.

Peckham was nominated to succeed W. J. Brace, head of the Hudson-Brace Motor Car Co., Kansas City, whose term expired.

Peckham is a veteran motor car merchant, having headed the big Ohio wholesale and retail organization for years. He has been active in association work.

## Dealers Lose Prior Rights In Cars Seized With Liquor

**Court Holds Vehicles Not Yet Paid  
For May Be Sold to Satisfy  
U. S. Claims**

SAN FRANCISCO, Cal., Jan. 29—Prohibition laws have widened in scope to such an extent that automobile dealers have to watch not only the financial, but the moral character of those who buy cars on time payments, according to a decision of great importance to the automotive industry, just rendered here by Judge M. T. Dooling of the United States District Court. According to this decision, dealers assume all the risks in cases in which automobiles are seized in bootlegging cases before contract purchasers have paid in full for the machines. Dealers can recover only such part of the money owed them as is left over after the government sells the machines so confiscated and takes out its claims. On several such sales recently, there has been nothing left over and the dealer has been left holding the sack.

Judge Dooling further decided that a claim by a dealer of innocence of the use to which a car has been put will not allow him to claim an automobile seized under the prohibition law.

The decision was the result of the arrest for bootlegging of Fred Melano, who was using a car that Frank Bello was buying from the H. O. Harrison Co. of this city, on payments. The Harrison company petitioned for a return of the machine, stating that the car had reverted to the company, because of lapses in the payments by Bello. Affidavits were presented showing that neither Bello nor the Harrison company had committed the offense against the prohibition law, but this contention was over-ruled by Judge Dooling, who held that the selling company had no claim other than on such balance as might be left after the government's claim against the user of the car when it was confiscated had been satisfied by the sale of the automobile.

## Effect of Automotive Uses on Gasoline Industry Told

WASHINGTON, Jan. 25—The effect of the automotive business on the gasoline and petroleum industry was outlined by A. C. Bedford, chairman of the board of directors of the Standard Oil Co. of New Jersey, testifying before the Senate Manufacturing Committee conducting the gasoline and oil inquiry.

The petroleum industry in 1906 had assets of \$750,000,000 and was producing about 33,000,000 barrels, of 42 gallons each, of kerosene, principally for use in lamps.

As a result largely of the advent of the automobile, Bedford declared, last year the combined assets of the industry were \$8,000,000,000 and it was supplying

the world with approximately 150,000,000 barrels of gasoline, chiefly for use in motor vehicles. The petroleum industry today is second only to the railroad industry as a factor in the commercial life of the nation, the witness said.

## Tent Solves Small Town's Show Problem

FAIRMONT, W. Va., Jan. 27—The annual automobile show of the Fairmont Automotive Association will be held March 6 to 10 in a large tent which has been purchased for the purpose. The tent will be fully equipped for the advantageous display of the exhibits and the comfort of the visitors. The tent is 90 by 180 feet.

Two years ago when a Billy Sunday tabernacle had been constructed in this small town for a series of meetings, the automobile show was held in the tabernacle and the abundant space made possible a satisfactory show. Since then, however, there has been no suitable building and the tent was decided upon as the solution. There has been some talk of dealers in other small towns near here leasing the tent outfit for shows of their own.

## WINTHER IN RECEIVER'S HANDS

MILWAUKEE, Wis., Jan. 27—Following a conference of stockholders of the Winther Motors, Inc., manufacturer of passenger and commercial vehicles at Kenosha, Wis., a petition for a receivership made to the Kenosha circuit court was granted. Judge Clifford E. Randall of Kenosha was appointed receiver.

The petition maintains that the Winther company had assets of \$1,500,000 and unfilled orders valued at \$500,000, and that its liabilities are not more than \$600,000. It is charged that differences existing among the directors have made it impossible to secure adequate working capital to keep the plant in profitable and productive operation, and that a receivership will open the way for definite action to improve the financial condition.

## GOOD BUSINESS AT ROCHESTER, N.Y.

ROCHESTER, N. Y., Jan. 27—Winter months, with the exception of show week, usually prove quite dead in the service stations of Rochester and the buying of cars is practically at a standstill. This winter, however, has proved to be a banner one for the Rochester dealers mainly through the various sales which have been conducted during the cold months. Used car dealers have profited especially by these sales and some of the agencies have acquired the habit of disposing of cars taken in trade.

## A CORRECTION

The new five-passenger Kissel phaeton has a wheelbase of 121 in. and sells for \$1485, instead of a wheelbase of 132 in. and price of \$1495, as stated in the Jan. 4 issue of MOTOR AGE.

## 1923 Detroit Show Is Sales and Attendance Record Maker

**Dealers Get Flying Start on New  
Year; Much Business Marks Motor  
Metropolis' Show**

DETROIT, Jan. 27—The 1923 Detroit show, concluding today, has given dealers a running start on a year's business far and beyond any start they have ever had before.

Sales at the show have outnumbered sales at any previous show almost three to one—something that is not explainable, or is at least not explained by anyone in any way other than that people have money and they want new cars for their old ones.

Practically all sales involve trade-ins—in many cases persons trading in open cars for enclosed ones, and dealers have prepared to handle this business by clearing out used car stocks in the past two months. Enclosed car business is reported to be aggregating 50 per cent of the total sales.

An unusual feature for shows in recent years is the interest and actual sales in heavy duty trucks. Seven sales of Pierce-Arrows were closed. Other trucks represented also reported sales. Special interest in the truck exhibit was centered upon a touring truck by Federal which was fitted for camping trips with convertible bunks and complete living accommodations.

## Ford Back at Show

Ford cars and trucks and tractors were back in the show after an absence of several years. Among the special exhibits by Ford were the four-door sedan on which production is now coming through, and the 7,000,000th engine built by the company.

Though a bulk of the buying was in the low priced lines, there was a good share of business for lines in all price classes, and, incidentally, makers in better priced lines came in for more business than might have been thought possible. Out of town made cars found more buyers than customarily.

Better business for the out-of-town products may be ascribed directly to the lining up of better dealers. Jordan has just recently opened a Detroit branch, Nash is now being sold by Miller-Judd, Stutz by Pungs and Schmitt, Earl by Frank Gmelin, Lexington by a new company.

Many dealers from out of the city attending the convention of the Michigan Automotive Trade Assn. during the week brought in groups of fellow townsmen who anticipate buying cars. This business will be closed back home or at the state shows which are to open soon.

Accessory exhibits at the show were centers of attraction and the exhibitors express complete satisfaction with the business they have developed and public interest aroused in their products.



## BUSINESS NOTES

Universal Service Motors Co., Philadelphia, plans to open a six-story steel and concrete garage with athletic club features in the rear of the Shubert Theater, Broad and Locust streets. On the roof of the new building will be tennis and handball courts and a running track.

An eight per cent dividend was distributed last week among the stockholders of the Black Hawk Tire & Rubber Co., of Des Moines, Ia.

Goodyear Tire & Rubber Co. has converted its Des Moines branch into zone headquarters for Iowa, southern Minnesota and part of Illinois. Frank Griesinger, former branch manager, assumed his new duties as zone manager on Jan. 1.

The Harris-Gary Co., jobbers of automobile parts and western distributors for the Rush products, have secured quarters at 1443 Locust street, Des Moines, Ia.

The Radiolite Battery Co. of Iowa was recently organized at Mason City, Ia. Offices are in the K. C. building. R. H. Thomas is president and A. D. Frick is secretary-treasurer.

The Spencer Storage Battery Co. of Spencer, Ia., has changed hands and will do business under the name of the Westinghouse Battery Sales Co.

President W. W. Wuchter of the Nebraska Tire & Rubber Co. reports a very successful year in 1922. Their figures show a 67 per cent gain over 1921, but, due to the reduction in prices of tires and tubes, the increase amounts to about 135 per cent in units manufactured.

The factory of the Ames-Holden Tire Co. at Kitchener, Canada, has been purchased by the B. F. Goodrich Co. of Akron and will be placed in production shortly on a full line of Goodrich tires. The plant will have a capacity of 1000 tires a day.

The Leterstone Sales Co., formerly a partnership and located at 2309 Indiana avenue, Chicago, has recently moved into new quarters at 2700 S. Michigan avenue and incorporated for \$100,000. Incorporators are B. J. Edelman and L. D. Leterman. The Leterstone Sales Co. carries on a jobbing and exporting business in automotive parts and equipment.

Victor J. Robinson has been appointed receiver for the Tuscara Rubber Co. of New Philadelphia, Ohio, by Federal Judge D. C. Westenhaver.

A new motor truck industry is being established at Madison, Wis. A charter has been granted to the Wisconsin Truck Co., organized with \$25,000 capital stock by John C. Westmont, C. W. Keniston and O. B. Porter. For

the present it is intended to conduct an assembling plant.

The plant of the Boone Tire & Rubber Co. at Chippewa Falls, Wis., which has been idle for over two years, has been purchased by the Wenstone Rubber Products Co. of Chicago, manufacturer of tires, tubes and rubber goods. The new owner has taken possession and installed a force of 75 operatives, which will be increased to take full advantage of the maximum existing capacity of 1000 tires a day.

Directors of the Reynolds Spring Co. have notified stockholders that they will be asked at the annual meeting on Feb. 14 to authorize the sale of 73,500 shares of additional common stock at \$12 a share, the proceeds to be used to provide funds for building operations, purchase of new equipment and additional working capital.

The Easthampton Cork Co., manufacturer of automobile brake linings, whose plant in Easthampton, Mass., was destroyed by fire recently, is to move its business to Leominster, Mass.

Claiming inability to pay in full the debts of the company, officers of the Climax Rubber Co., of Columbus, O., have filed a petition in bankruptcy in the Federal courts at Columbus. The application was made by Irving S. Hoffman, president of the corporation. Liabilities are listed at \$265,381. Assets are listed at \$537,420.

Application for the appointment of a receiver for the Ohio Tractor Co., Columbus, O., which recently announced it would be dissolved under the orders of the court, has been filed in Common Pleas court by Benjamin C. Zuhars, who asks that his claim for \$29,516, claimed as salary due, be paid.

The Auto Gear & Parts Co., Cincinnati, O., has been incorporated with a capital of \$25,000 to manufacture and deal in automobile gears, parts and accessories.

Cox Brass Co., Albany, N. Y., is making extensive additions to its plant for the production of Hylco bumpers. New blacksmith shops, plating plant, forge shop and heat treating plants are being installed.

Tentative plans have been adopted under which the Fisher Body Co. will issue \$20,000,000 of 6 per cent serial notes to be sold through the Bankers Trust Co. of New York and 100,000 shares of no par common stock, to be offered to its common stock holders at \$75 a share.

The name of the Double Fabric Tire Co., Auburn, Ind., has been changed to the Auburn Rubber Co. This change in no way affects the financial standing or policies of the company, or changes its ownership in any way. It is made to avoid confusing Auburn tires with other tires with somewhat similar titles.

## Boston Motor Colony Mourns Death of Two Old-Timers

BOSTON, Jan. 27—Boston's motor colony mourns the death of two men widely known in the trade, one of which occurred during show week at New York, that of Rudolph R. Ross. The other was William E. Potter.

Ross, who was retail sales manager for the Sills - Chevrolet Company here, dropped dead while coasting with his five year old daughter. He was born in New York in 1874 and entered the motor trade when he brought the first Packard car to Boston in 1901.

William E. Potter, who had been manager of the La Fayette line for the C. P. Rockwell Company, died at Yonkers, N. Y., recently. He started at New York and was well known among the old-timers there, for he was with the American Mercedes Company of Long Island in 1902.

## PIONEER CLUB SUCCUMBS

CHICAGO, Jan. 26—The Old Town Club, successor to the Chicago Automobile Club founded in 1900, has filed a voluntary petition in bankruptcy listing liabilities at \$37,315 as compared with assets of \$178,002. This was the pioneer

automobile club of Chicago founded primarily as a social institution such as were most of the early automobile clubs. Although it was active at one time in testing devices for its members and conducting runs and races it never developed the service facilities of the modern automobile club and remained primarily a social organization. It maintained a club house at 321 Plymouth Court, in the loop. Its membership has dwindled rapidly, falling from 800 in 1918 to a scant 100 today. Some of the wealthiest men in Chicago were stockholders in and members of the club.

## FRAUDULENT TIRE SALESMAN

WINSTON-SALEM, N. C., Jan. 29—The Hanes Rubber Co., manufacturer of tires and tubes, states that an imposter claiming to represent it has been traveling through Pennsylvania and New Jersey defrauding dealers by getting them to sign contracts and make partial payments either by cash or check. He is said to have endorsed and cashed checks made payable to the company. He is said to have given these names: H. A. Biddle, W. A. Lyone and H. A. Conine. The company states that its salesmen are not authorized to make collections or accept deposits on orders.

## Lower License for Old Cars Desired by Oregon Dealers

### Move Made for Legislation Changing Basis of Fees from Weight to Value of Vehicle

PORTLAND, Ore., Jan. 27.—Automobile dealers and motorists of Oregon, represented by the Automobile Dealers' Association of Portland and the Oregon State Motor Association, are waging a campaign to bring about a reduction in the license fees of second-hand automobiles in Oregon. The state legislature is at the present time holding its biennial session and it is the hope of the automobile men to have a bill passed bringing relief from the excessive tax.

At present automobiles in Oregon are licensed in accordance to weight and without regard to value, ranging from \$18 for the lightest to \$60 and more for the heaviest vehicles. Old vehicles, even be they so decrepit they can barely get around on four wheels, have to pay the same license as new vehicles, worth many times as much, of the same weight.

This system has resulted in many of the old cars being kept in storage at least part of the year. It has also been highly detrimental to the used car market and has sometimes resulted in the license fees being as great as the value of the car without a license.

A system of lowering the license fees and applying the principle of value rather than weight, in justice to the used car owner, is being urged by committees from the two bodies conferring with the state legislators. Neither the dealers' body or the Oregon State Motor Association desires a reduction in revenues, and has promised its support to an increase in the gasoline tax, if necessary, to make up the difference lost through a lower and an altered license system. There is already a gasoline tax of two cents a gallon in force in the state, but the automobile men state their willingness to see this go to four cents, if necessary. Under the law all the money from this source and from the license fees, excepting administrative expenses of the state traffic bureau, must go to road improvement and maintenance.

Under the system now in force the automobile is not included in the general personal property tax at all. There is a movement on foot at the present session of the legislature to place the motor vehicle back on the tax rolls, in addition to the license fee and gasoline tax, but this is being strenuously fought.

## CHICAGO TIRE DEALERS ELECT

CHICAGO, Jan. 27—The Chicago Tire Dealers Association has elected officers as follows: President, Robert W. Sloan; vice-president, Alfred Perlman; treasurer, P. J. Raasch. These officers will be installed the evening of Feb. 1, at a dinner at the Lexington Hotel at which George J. Burger, president of the National Tire Dealers Association, is expected to deliver an address.

## IN THE RETAIL FIELD

After many years occupancy of quarters on Cannon street, Bridgeport, Conn., the Blue Ribbon Tire Service, Inc., is now occupying its new home at 554-556 Fairfield avenue.

A new Peerless handling organization, the Hoffer-Lichtenwalner Co., Reading, Pa., with salesrooms at 538 Franklin street, has been formed by Chas. L. Hoffer, formerly Packard representative, and Norton L. Wichtenwalner, of Allentown, Peerless and Hupmobile representative in that city. The latter will continue in business there, with Hoffer in charge of the Reading offices.

George C. Wynkoop, formerly general manager of the Alexander Hat Co.'s plant in West Reading, Pa., has been made vice-president of the Reading Automobile Co., of which H. O. Koller is president. Wynkoop will be salesmanager and assistant general manager of the company.

J. W. B. Green, Jr., for the last six years used car manager of the Vim Motor Co., Philadelphia, has been appointed salesmanager in charge of new and used trucks.

George C. Reinhold, 2506 N. Broad street, Philadelphia, has been appointed distributor for Case cars in eastern Pennsylvania, southern New Jersey and the eastern shore of Maryland.

What was formerly the Philadelphia branch of the Splittorf Electrical Co. has been purchased by the former branch manager, E. L. Hehn, and is now located on N. Twenty-second street.

The Nebraska Buick Co. of Sioux City, Ia., has recently leased the Shoberg building at Thirteenth and Pierce streets. The new quarters is regarded as one of the finest automobile locations in the city.

The Thompson Motor Co. has been organized at Estherville, Ia., to handle Hudson and Essex cars.

The Reo Sales Company of Chariton, Ia., has opened a branch at Ottumwa, Ia.

The Kentucky-Lexington Co. at 434 E. Broadway, Lexington, Ky., at present distributor of the Lexington, is to handle the Columbia in Louisville and surrounding territory. The Columbia was formerly distributed by the Marmon-Louisville Co.

David Grody, pioneer Syracuse, N. Y., automobile dealer, former president of the Syracuse Motor Car Co., has taken over the agency for the Paige car.

Baker-Fickle Motor Co., Inc., Bristol, Va., has secured an amendment to its charter, changing the name to Baker-Barker Co., Inc.

J. R. Whitley has opened a garage on W. Minson street, Monroe, N. C.

Central Motor Co., Florence, S. C., has been chartered with a capital stock of \$5,000.

Fire destroyed the garage of Henry & Kleupelberg at Brevard, N. C. Twelve cars, equipment, accessories and supplies were burned.

The Herbert Motor Sales Co. has been chartered at Cincinnati, O., with an authorized capital of \$25,000 by John A. Herbert and others.

The Auto Gear & Parts Co. has been chartered at Cincinnati, O., with a capital of \$23,000, to manufacture various parts for automobiles, by A. H. Hollmer, E. L. Gray and others.

The Oakland Motor Car Co. has been organized at Columbus, O., with Charles Pausch, president, and C. E. Quigley, secretary-treasurer, to distribute Oakland cars at 594 N. High street.

Lee-Dixie Motors, 315-17 W. Forty-seventh street, New York, has been appointed distributors for Signal motor trucks in the metropolitan district.

Northwest Buick Co., 3444 Lawrence avenue, Chicago, has been incorporated with a capital of \$50,000. This company recently erected a new building.

Wood River Motor Co., 331 Wood River avenue, Wood River, Ill., has been incorporated with capital of \$20,000 by H. H. Starkey and others.

Parkside Motor Sales Co., 3843 W. Madison street, Chicago, has been incorporated with capital of \$10,000 to deal in automobiles and motorcycles.

Schönig Motors Corp., 1937 E. Seventy-fifth street, Chicago, has been incorporated with capital of \$25,000 by Carl W. Schönig and others.

Franklin-Butler Motors, Inc., Chicago, Franklin dealer at 2251 S. Michigan avenue, has opened a north side branch at 4920 Sheridan road.

North Side Motors Co., handling Peerless, Oldsmobile, Durant and Star cars in Chicago, has established new quarters at 5721 Broadway.

The Waugh Bros. Motor Car Co. has been organized at Peoria, Ill. Capital stock has been fixed at \$50,000. A garage and sales agency will be operated at 229 N. Jefferson street.

Garfield Motor Sales Co., 45 E. Garfield boulevard, Chicago, has completed a new service station 50x176 ft.

Pearl Motor Sales Co., Chicago, has completed a new sales room and service station at Spaulding and Milwaukee avenues, for selling and servicing Peerless, Paige, Jewett, Willys Knight and Overland cars.

The Rochelle, Ill., automobile dealers have organized and voted to affiliate with the Illinois Automotive Trade Assn.

The R. D. Rockstead Co., Milwaukee, distributor of the Lexington, Gardner and Earl in Wisconsin, has moved into new and more commodious quarters at 2713-2715 Grand avenue, retaining the original sales and service building at 142-152 Seventh street as an auxiliary service station and used car exchange.

The DuBois-Haevens Co., Green Bay, Wis., has been appointed Brown county dealer in the Dord and Olds.

The Wells & Chase Auto Co., Medford, Wis., Ford dealer, has disposed of its business and franchise to C. A. Fleming of the same city, who became active manager and will continue the business as the Fleming Motor Co. The Wells & Chase company will devote its attention to its branch at Abbotsford, Wis., taking over the Fleming interest.

L. P. Rosenbaum, Fond du Lac, Wis., has acquired the business building at 28-32 Fourth street, and will establish a sales and service station for tractors, farm trucks and power farm operating equipment of all kinds.

The H. T. Allen Co. has signed up for the Earl agency in Greenfield, Mass.

F. J. McDonald has taken a contract to sell the Davis in Dalton, Mass.

Quinlan Motors Co., Chicago Moon distributor recently gave a dinner for its Chicago dealers, at which dividends of the Dealers' Sales Corp., in which all the Chicago Moon dealers are stockholders, were distributed. The regular quarterly dividend was 2½ per cent and an extra dividend of 5 per cent was paid.

Consolidated Motors, Ltd., 235 Main street, Winnipeg, Man., will hereafter represent the Reo in the Province of Manitoba, with headquarters in Winnipeg.

The Daniels-Paris, Boston, has opened a branch in Springfield, Mass., under the management of Noyes C. French, for the sale of the Daniels.

Smith & McCarthy have the distribution of the Franklin in Pittsfield, Mass., beginning Feb. 6.

A. Park Shaw has resigned from the position of sales manager for Smith & McCarthy, Pittsfield, Mass., and has bought the interest of Rigobert McFarlane in the T. T. M. Co., Chevrolet dealer, in that city, which will continue to do business in that name. A. B. Treadwell is the other member of the company.

The Mullikin-Kincaid Motor Car Co. has been formed at Champaign, Ill. A garage and sales agency will be opened at 44 Main street.

The Brodhead Motor Co. of East St. Louis, Ill., distributor of the Ford car, has taken a seven year lease on a new building to be erected at the southwest corner of Eighth street and St. Louis avenue. The structure will be 100x100 ft. and will cost \$50,000.

W. A. Rall and W. H. Borschel, Cedar Rapids, Ia., have formed a partnership and will have the Oldsmobile agency. The salesrooms will be in the Lattner building.

The Allen-Buick Co., 1720 Fourth avenue, Rock Island, Ill., has been incorporated with \$25,000 capital to handle the Buick line.

The Cooper Motor Co. of Omaha has received the franchise for the retail sales of the Star and Durant cars in Omaha.

J. W. Riley has bought from W. H. Jager of the Northampton Garage Co. the building occupied by that concern in Northampton, Mass., and will build a two-story addition.

Instructive addresses on merchandising and profit and the benefits through membership in an active, state-wide organization, with the showing of an educational motion picture set, were the outstanding features of the monthly meeting of the Automobile Accessories Business Assn. at the headquarters of the Philadelphia Automobile Trade Assn. on the evening of Jan. 19.

## Arkansas Denied Further Federal Aid for Highways

### Drastic Action Taken Because of State's Failure to Properly Maintain Roads Built

WASHINGTON, Jan. 27.—Because of failure to properly maintain Federal aid highways built with the help of Federal funds, officials of the State of Arkansas have been notified by Federal officials that no more Federal funds will be given that state for new construction of highways until conditions are remedied.

It is charged by the Bureau of Public Roads that the State of Arkansas has not only failed to maintain its highways after they were built, but that the state officials are not complying with the law in the expenditure of Federal moneys.

To date the Federal government has expended in the state \$7,852,039 on the construction of 639.3 miles of highways, which has been completed. In addition to this a sum of \$4,995,263 has been allotted to that state for road work now under construction. Unless conditions are remedied, Secretary Wallace of the Agricultural Department, under whose supervision the Bureau of Public Roads comes, the moneys allotted will be withdrawn and until the provisions of the Highway act of 1921 are complied with in every detail, he has informed Governor McRae no more Federal money will be allotted.

### DEALERS PLAN SHOW

CHICAGO, Jan. 26—Dealers in the south section of the city have about completed plans for the presentation on Feb. 26 of an automobile show. It is to be the first community show on the south side and will mark the opening of the Midway Masonic Temple, an impressive structure, well equipped to accommodate a show of the kind anticipated. Dealers at a meeting last week received the idea with enthusiasm and Roy McGee, chairman of the South Mid-Town Merchants' & Manufacturers' Assn., promoter of the event, is certain that a big success can be made.

The idea held forth is to promote the "buy-at-home" spirit, bringing home to the prospect the fact that he can buy his motor needs right there in his own neighborhood. Some 50 dealers in automobiles, tires and accessories are included in the territory which the show will benefit.

### BIFLEX TO DOUBLE PRODUCTION

CHICAGO, Jan. 29—Completion of a new factory unit now under construction at North Chicago by the Biflex Products Co. will enable the company to double its production of Biflex bumpers for automobiles. This company has expanded rapidly since it was organized in 1919 and its building plan provides for still further growth.



## CONCERNING MEN YOU KNOW

Don E. Bates, secretary and treasurer of the Reo Motor Car Co., has been elected president of the Lansing Chamber of Commerce. H. B. Lundberg, vice-president and general manager of the Michigan Screw Co., was chosen second vice-president.

Harry C. Teel, superintendent of Reo Motors Co., has been elected to the directorate of the Federal Drop Forge Co. to fill the vacancy caused by the death of Samuel Carpenter. All the officers of the company were elected to succeed themselves.

Harry Viet, for some years director of purchases for Continental Motors Corp., has become associated with the purchasing division of Fisher Body Co.

C. Thomas Barbour, formerly purchasing agent for Bearings Service Co., has joined the Dayton Air Brush Co. as direct factory representative.

William E. Holler has been added to the staff of Durant Motors as assistant to W. C. Durant, with headquarters in New York City. Holler was general manager of the Imperial Wheel Works of Flint, Mich., assuming that position last October, following his retirement as managing director of the Flint Chamber of Commerce. Holler's activities with the wheel company brought about the sale of that concern to the Hayes Wheel Co. of Jackson, which was ratified on Jan. 2, for which he was given credit.

Lon R. Smith of Indianapolis has been appointed consulting engineer on both sales and engineering for the Bishop & Babcock Co. of Cleveland, manufacturer of the Bishop-Babcock aquastat. Smith is an active member of the S. A. E. and at one time was sales manager of the Buda company.

Henry T. Chandler has become associated with the Vanadium Corp. of America as metallurgical engineer with headquarters in Detroit. Chandler formerly was associated with C. Harold Wills & Co. as metallurgical engineer and before that was research engineer for the Ford Motor Co. During his connection with the Ford company as research engineer, exhaustive experiments in iron and steel were made in the course of which all the elements that enter into the composition of alloy steels were thoroughly investigated.

Harry Doty, formerly Chicago branch manager for the Haynes, has been appointed branch manager of the Roamer Motor Car Co. of Illinois, Michigan avenue and Twenty-fifth street, Chicago, succeeding J. E. Carter, who resigned to accept management of a branch of Charles Lange Bros. & Co.

J. A. Bowerman has resigned his position with the Fisk division of the Fisk Rubber Co. at Chicopee Falls, Mass. Bowerman has been with the company for five years, during the last three of which he served as assistant general production superintendent.

Harrie R. Williams has resigned from the office of vice-president and sales manager for the J. & B. Co., manufacturers of magnetos and spark plugs, Pittsfield, Mass.

Harry Smith, formerly with Stevens-Duryea, Inc., and more recently with the Springfield Oldsmobile Co., Springfield, Mass., joined the sales organization of the Hendee Mfg. Co. as special factory representative.

William M. Sweet has been elected president of the Klaxon Co. of Newark, N. J., manufacturer of Klaxon horns and affiliated with General Motors, moving up from the position of general manager of the company, which he has held for some time. The new title was awarded at a recent meeting of the stockholders, who also named Fred W. Ayers for vice-president and M. I. Mullen for secretary and treasurer.

Frank B. Willis, sales manager of the H. C. S. Motor Car Co. of Indianapolis, Ind., announces the appointment of "Cash" Baker, well known in automotive circles as special factory representative in the field. Baker will concentrate his sales efforts on the new H. C. S. six-cylinder car.

C. H. White has been appointed manager of the Syracuse, N. Y., branch of the Mason Tire & Rubber Co., succeeding Arthur Campbell, who has been appointed salesmanager of the New York City branch.

Harry T. Watkins, formerly with American Motor Equipment Co., Boston, has been appointed the factory sales representative of Cox Brass Manufacturing Co. for the eastern territory with headquarters at Boston.

artificially sustaining prices, but declared that, fortunately, such propaganda had not been favorably received by the farmers. Increased production and increased consumption of farm products are the elements of prosperity, he declared.

It was his opinion that within the next two months a vast amount of live stock will be marketed at profitable prices and the farmers will have early in the season a considerable sum of money available for purchases. He referred to the fact that most farmers now consider the automobile a practical necessity.

### M. A. M. A. ELECTS

NEW YORK, Jan. 29—Following the annual meeting of the Motor and Accessory Manufacturers' Association at which the four retiring members of the board of directors—W. O. Rutherford, G. Brewer Griffin, J. McComb and C. H. L. Flinterman—were re-elected, the new board met and selected the following officers: President, W. C. Rutherford, vice-president of B. F. Goodrich Co.; first vice-president, A. W. Copland; second vice-president, H. L. Horning; third vice-president, E. P. Hammond; treasurer, L. M. Wainwright, who was elected to this office for the fifteenth consecutive time; assistant treasurer and secretary, G. Brewer Griffin; general manager, M. L. Heminway; general counsel, S. S. Meyers.

## Receivers Appointed to Clear Up Parenti Sale

### Hanover Motor Car Co. Holds Up Payment of Purchase Price Until Title Is Assured

BUFFALO, N. Y., Jan. 27—Federal Judge Hazel has appointed the Marine Trust Co. and W. W. Reilly receivers for the Parenti Motors Corporation in an equity action brought by shareholders to set aside a deed of trust given last April to the Marine Trust Co. for the benefit of creditors.

The Marine Trust Co., which was not a creditor of the Parenti firm, undertook to act as trustee upon authorization of the directors of the company. The suit was heard before Judge Philip A. Laing, who as special master decided that the Parenti company was insolvent when the deed of trust was given. He also held that the bank made a good sale for the creditors when it agreed to sell the property to the Hanover Motor Car Co. for \$225,000, and that it acted in good faith.

The Hanover company paid \$25,000 and then, because of the action of some of the stockholders who sought to buy the property from the trustees, it refused to pay more, fearing that the action might endanger its title. Judge Laing ruled that the stipulations of the deed of trust authorized acts which would delay the payment of creditors, hamper the trustee and authorize an administration of the trust contrary to law. To clear the matter up, two receivers were appointed by Judge Hazel.

David C. Myers of New York, counsel for the Hanover company, appeared in court, saying that his client is ready to pay \$225,000 as soon as the receivers are in a position to complete the contract.

Creditors appeared in court and stated that they were ready to accept the contract made by the Hanover company.

### CYLINDER GRINDERS MEET

MEMPHIS, Tenn., Jan. 30—Automotive mechanics from six states, specializing in the grinding of cylinders, pistons and other parts of the automobile engine, met at the Chamber of Commerce, Memphis, Jan. 8, and organized the Southern States Grinders' Association. The association will make an effort to build good will for concerns in the business and to conduct an educational campaign to acquaint the public with the economic saving that the special line offers automobile and truck owners.

L. P. Cook was elected president; J. Georgehan, vice-president; J. G. Rogers, secretary and treasurer. Twenty-two out-of-town automotive men attended the meeting, representing Tennessee, Arkansas, Mississippi, Louisiana, Alabama and Kentucky. Most of the session was devoted to the details of organization and adoption of a constitution and by-laws.

## Germany Has Only 165,000 Motor Vehicles Registered

WASHINGTON, Jan. 26.—Registration of automotive equipment in Germany as of July 1, 1922, according to figures just received by the automotive division of the Department of Commerce, show that there were 165,315 automotive vehicles, compared with 118,640 on July 1, 1921. This represents an increase in automotive equipment for the year of 39.3 per cent.

The registration shows that there were 82,505 passenger cars, 42,587 trucks and 37,941 motorcycles. The remainder consists of tractors, fire fighting apparatus, etc. The figures show a ratio of one automotive vehicle to each 360 of population.

### HALL PREDICTS PROSPERITY

CHICAGO, Jan. 26—A promising outlook for the farmer as a prospective buyer of manufactured commodities, including automobiles, this year was pictured by Guy H. Hall, director of the National Institute of Progressive Farming, in an address this week before the Chicago Business Editors' Association.

Hall recounted the progress made by the farmer in the last six months of 1922 as the prices of his products moved steadily upward and as his crops developed satisfactorily in quantity. He told of agitation from some quarters for the limitation of production as a means of

# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Lien Laws Again

Q—We understand that several states have adopted laws for the protection of automobile mechanics. Will you please advise what states have enacted such legislation and give a synopsis of the various provisions of law in force?—O. M. Phelps, President Automobile Trades Association of South Dakota, Huron, S. D.

Your own state, in section 1700, entitled "Mechanics' Liens on Personal Property," South Dakota Revised Code 1919, gives a lien to automobile mechanics and others in concise language. The statute reads:

"A person who makes, alters or repairs any article of personal property, at the request of the owner or legal possessor of the property, has a lien on the same for his reasonable charges for work done and materials furnished, and may retain possession of the same until the charges are paid. If not paid within two months after the work is done, the person may proceed to sell the property at public auction, by giving ten days' notice of the sale by advertising in some newspaper published in the county in which the work was done, or, if there be no newspaper published in the county, then by posting up notices of the sale in three of the most public places in the town where the work was done, for ten days previous to the sale. The proceeds of the sale must be applied to the discharge of the lien and the cost of keeping and selling the property."

This is a very comprehensive statement of lien and enforcement.

The objection to this lien is that it follows the old common law lien requiring the mechanic or repairmen to retain possession to support his lien. The law should be amended to cover cases where the car, or other personalty, is turned over to the owner after repairs are made on his promise to pay. This could be done by requiring the repairman to file with the county recorder a statement of the charges against the property. The law should contain a provision making the lien, up to a reasonable charge, at least, superior to a prior recorded chattel mortgage.

The objection above-mentioned is an important one. Most customers are in immediate need of their cars after repairing, and most garage keepers and repairmen will turn over such repaired cars to the owners. Most business is done on credit in all fields. The garage man does not want to appear a hard fisted business man, yet, under the laws of most states, if he once turns loose the repaired car his lien is lost. He can't explain the law to every customer. That would lose business for him, so usually he bears all the risks silently and suffers all the losses from his customers who do not or cannot pay.

### The Readers' Clearing House

**T**HIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

*Readers' names will not be published with articles, if a request to this effect is received with the letter. The name and address should be given, however, so that we can send a copy of our answer direct by letter. This saves waiting for the answer to be published, which sometimes occurs several weeks later, depending upon the space available.*

*Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.*

*Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.*

*Addresses of business firms will not be published in this department but will be supplied by letter.*

*Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.*

From the standpoint of general business principles a customer is aided and is more able to pay by having his car repaired and having it released to him. And the repairman should be protected by being given the right to file his lien claim so that all others would know that such charges stood against the car in the owner's possession. This is a progressive business principle and the right should be extended at law. Illinois has included this feature in its new act.

There is another thing that should be considered. When a car or other chattel is brought in for repairs, the repairman may proceed and do the work only to learn afterward that there is a chattel mortgage against the car. In practically all states this mortgage will take priority and cut out the repairman's claim for repairs. Cases of this kind are arising every day.

Now, because some owners are dishonest, crooked or not, the repairman does not like to be required to put his customer through a questionnaire, like the income tax report, to find out if he is safe in proceeding to repair, then to

make sure of everything, to get a lawyer to make an exhaustive search to see if a chattel mortgage is on record somewhere which would be superior to his claim for charges after the work is done. The repairman is usually too busy to make these investigations, and he can't afford to offend his customers by having them wait while he searches. So he proceeds, and every so often he runs up against the law which gives the mortgage holder prior rights to his claim.

Of course, the loan agents, automobile financing firms, and all dealing in automobile loans will be against any recognizing prior rights to a repair claim. But if we look at it from the broader standpoint of right and helpful legislation to the garage man, we will consider these facts: A mortgage covers the car; if the car is repaired the mortgage assets are thereby increased that much. Should the mortgage holder be allowed to appropriate the increase to his own advantage and exclude the one who made such increase? If both parties are innocent in the matter, who is the least innocent? When a mortgage holder permits the mortgagor to have possession and control over the property, does he not thereby hold him out to the world as his agent to have at least all reasonable repairs made necessary for the proper upkeep and running of the property? And on this theory, should not the repair claim come first before his mortgage?

As the law now stands, it is possible for the mortgage holder and the car owner to get together fraudulently and have a car repaired which the mortgage holder could then take under his claim of priority. And of course a similar fixing could be made between the owner and the repairman should priority be given the latter. So Wisconsin has given priority over a chattel mortgage to mechanics up to \$75.00 for repairs.

The 1917 law in Illinois giving priority to garage keepers was held unconstitutional, on various grounds, and invalid. The present law in Illinois is a very clumsy affair, and about the only advantage it gives is that a lien may be had by filing claim with the county recorder, and possession of the car may be given up to the owner. Compared to your own state, it is quite lengthy. Selling a car for charges requires as much work as foreclosing a mortgage. It lacks some of the advantages in your own concise law, since it precludes the garage and repair claim where a mortgage holder claims priority.

You can get a copy of the state laws on the subject by addressing the various secretaries of state. North Dakota, Wisconsin and Michigan might be compared with Illinois and your own state law.



### Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

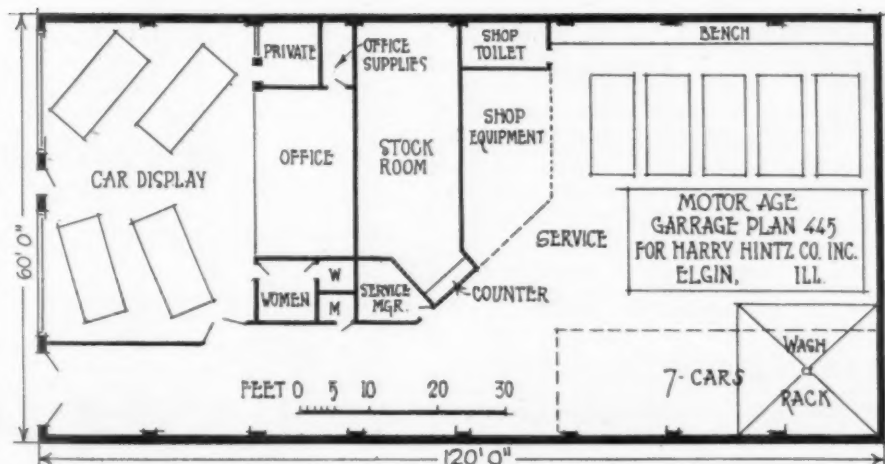
Number of men employed in repair shop.

How much of an accessory department is anticipated.

## Flexible Plan for One-Story Service and Sales Garage

Q.—We are the new Dodge dealers in this territory and expect to erect a new sales and service station. Can you send us some sketches or diagrams? This station will be located on the principal street in the city, facing east and with no alley. Size of lot is 60x120 ft.

A single story building is requested with showroom, offices, stockroom and



room for service station. About four mechanics will be employed at all times. —Harry Hintz Co., Inc., Elgin, Ill.

Your lot is a very economical width for an inside lot garage, giving room for a driveway without taking too much from the frontage.

As laid out, this plan is very flexible, the different departments may be moved forward or back to give one or the other more floor space. If the roof is trussed as it should be, the floor will be post

free and partitions may be placed as desired, but we believe the arrangement will work out pretty well as shown.

You will be obliged to get all your light through skylights and ventilation through roof ventilators, so it would be well to be liberal with both. A good method is to place a skylight in each bay, but alternate them, first one side of the building then the other. This system gives very uniform lighting.

### STARTING TROUBLES

Q.—In the November 9 issue of MOTOR AGE, it stated that in burning in a Ford bearing a rock of .004 or .005 inch should be left between the upper half of the bearing which is in the crankcase and the bearing cap edge. Now, does this mean that this clearance should be left on each side or that when the bearing is rocked so that it touches at one side that there will be this much clearance at the other side?

1—This much clearance should be left at one side only.

2—Explain the figures 25 ten thousandths and the difference between this and 25 thousandths of an inch. How are they written in figures?

2—25 ten thousandths should be written in figures .0025 while 25 thousandths should be written .025. In comparing these two it will be seen that in either case we first say the figures, that is, the 25, then we look at the number of decimal points and if there are three of them, that is, three figures or ciphers at the right of the decimal point, it means thousandths, while if there are four ciphers or figures at the right of the decimal point it means ten thousandths.

3—A 1922 Ford car starts hard in cold weather. It turns over fairly easily but will not start. Once it does get started, however, it will then start again easily.

3—The trouble is probably in the carbureter and possibly you are not turning the needle valve far enough open or else the choker does not shut the air off sufficiently to draw gasoline into the cylinders. After the engine starts once, the easy starting may be accounted for by the fact that the engine is slightly warm or that there is gasoline vapor in the manifold.

It is also possible that with the engine cold the starter cranks the engine

just slow enough so that the spark is not good and you can easily check the spark by removing a wire from the spark plug and holding it within 1/16 in. of the top of the plug while someone else works the starter button. If sparks jump every time at this 1/16 gap and then jump the gap inside of the cylinder also, it would show that the ignition is O. K. On many cars electric heating coils of some sort are used in connection with the carbureter and a device of this type, used in the intake manifold, might prove helpful in starting.

4—We have a Ford car on which the generator does not charge at first, but after the car has been driven about half a mile and the engine has warmed up, the generator will charge and, after that, is O. K.—Wisconsin Subscriber.

4—Trouble of this nature is usually due to oil getting on the commutator and soaking into the brushes and can be remedied by putting in a new set of brushes in the generator.

### VALVE TIMING ON CADILLAC

Q.—Is it possible to put timing gears in the front end of a 1914 Cadillac? The chain drive in the front end of this car makes a rattling noise in the valve tappets.

1—Gears cannot be installed, but a new chain will overcome the trouble.

2—What is the valve timing on this car?—M. B. Krith, Chevrolet Service Station, New Canaan, Conn.

2—The intake opens 10 degs. after top dead center as measured on the flywheel. The exhaust closes 8 degs. after top dead center measured on the flywheel. This would be when the piston is approximately 1/32 down from top dead center, or just at the start of the intake stroke.

### WHAT MAKES A STARTING MOTOR RUN BACKWARD?

Q.—We have a model M. F. Auto-Lite starting motor which is wired up by an Auto-Lite diagram and is just like another starting motor of the same model. We find however, that it runs in the wrong direction. Explain reason for this. —W. G. Fannig, Dyersburg, Tenn.

We assume by the wiring of the starting motor that you refer to the internal connections and if you have two starting motors of the same model and you are perfectly sure that they are connected the same internally and they still run in the wrong direction then there are two possible causes of the trouble.

One possibility is that you have an armature which is unsuitable. We would suggest swapping armatures between the two machines to see if the condition of rotation changes when the armature is changed. Another possibility is that the field coils are wound in a different direction and this is a thing that can be checked by using a compass on the outside of the frame of the machine when the starting motor is being operated by a battery.

In doing this you must of course be careful to use the battery in the same way on both starting motors so that you do not get a reversal of battery current which would reverse the compass reading. There is also possibility of a human error and we would suggest your looking very carefully to see that there is no mistake about the corresponding brushes being grounded on the two machines and that all conditions are identical. If the armatures, field coils and connections are alike the two machines will have to rotate in the same direction.

## Overland Oiling and Ignition Systems

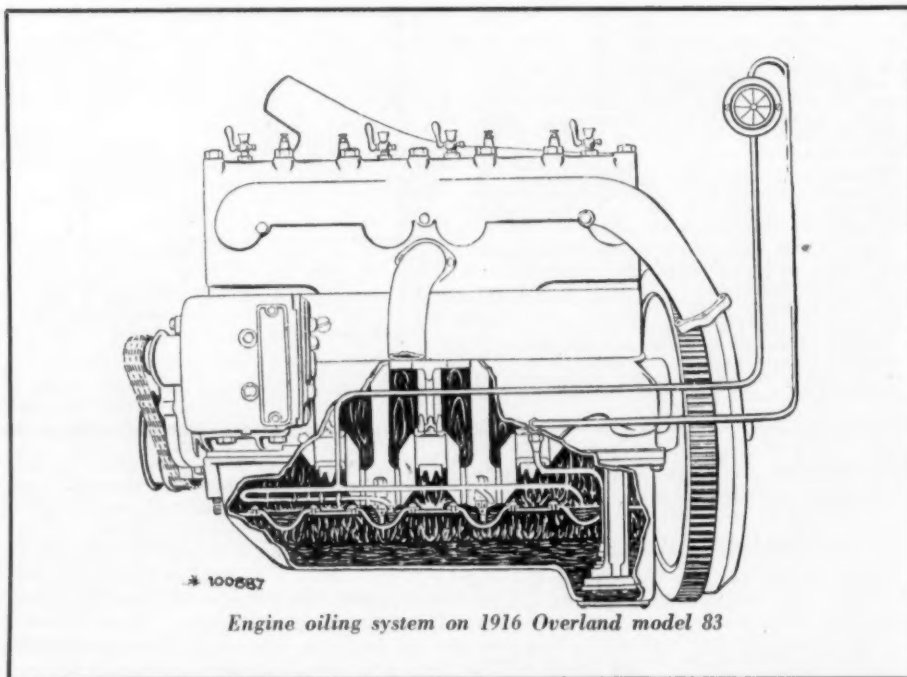
Q—Explain the ignition system, also the oiling system, on 1916 Overland model 83-B. All of the oil tubing and also the oil pump have been removed from inside of the crankcase and we would like to know just how it should be replaced. This car has been run some without the pump but we do not know how much. If the oil pump were discarded, would the splash in the crankcase be enough to care for the engine?—R. B. Bement, Wichita, Kan.

Wiring diagram and illustration of the oiling system are shown. The oil pump is driven from the camshaft and draws up oil from the base of the crankcase. From the oil pump a pipe leads up to the indicator on the dash and from this indicator another pipe supplies oil to the four troughs into which the connecting rods dip.

The cut is not perfectly clear, but there should evidently be a branch of the pipe from the oil gage leading to each of the troughs. If the engine were run without the oil pump working, the bearings would burn out in a short time unless the crankcase had been filled with oil above the normal level and the oil was so high that it rose above the troughs in spite of the fact that there was no oil pump being used.

This should be clear from the illustration in which it can be seen that there must be oil in the troughs into which the connecting rods dip. The capacity of the oil reservoir is five quarts. This amount of oil brings the indicator of the gage on the side of the crankcase to within one inch of the top. Oil in circulating goes through a strainer which must be kept clean. This is accessible by removing the large plate on the crankcase right beneath the oil pump. This screen may be removed and cleaned by dipping into a pail of gasoline.

This should be done every 500 miles. The lubricant circulates freely through the system as long as the small wheel in the dash sight feed revolves. As soon as this wheel stops, however, or the sight feed glass shows clear, this is an indica-



tion that the oil supply is exhausted or that there is an obstruction in the circulation of the oil which should be located and remedied immediately.

### BATTERY WON'T STAY CHARGED

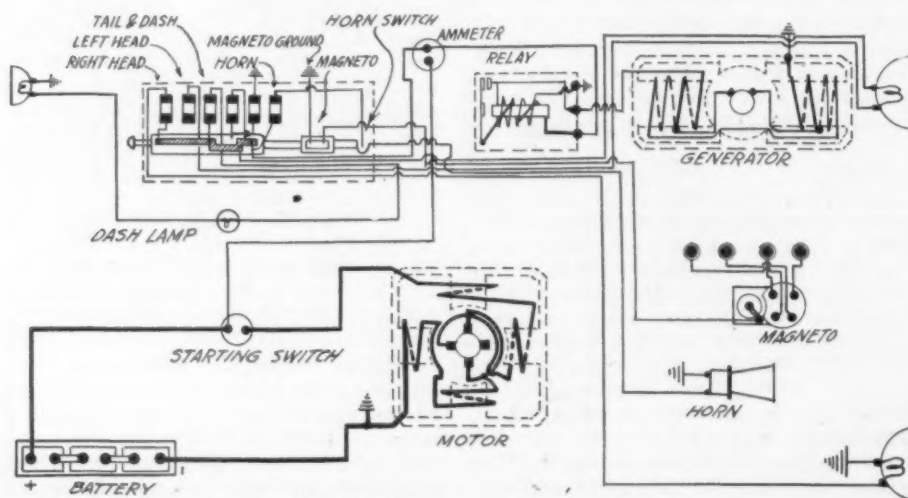
Q—We have a Buick model 24-B, on which we have trouble keeping the battery charged. The party who owns it has taken it to several shops but they have been unable to locate any short circuits that would cause this condition. Sometimes the battery will stay charged for several months and again it will run down over night. A few days ago the owner brought the car into our shop to have a little work done on it. After the engine was shut off I noticed that the motor generator was rotating slowly. I disconnected the negative terminal of the battery and tried to locate the trouble. After working with it awhile I found that it had stopped and still I had not found the cause of the trouble. Could you advise where the trouble might be?—N. A. Burt Garage, Shallow Water, Kans.

On the model 24-B Buick the operation of the starter pedal first mechanically closes the contact points in the cut-

out. This allows a certain amount of battery current to flow to the generator armature, causing it to rotate. This rotation is used for the purpose of easily meshing the gears. Continued action of the starting pedal pushes the gears into mesh and then makes final contact so as to draw a heavy current from the battery for the starting motor action.

As far as we can figure, there is one cause of the trouble. That is, the points in the cut-out are staying together. This may be due to their being burnt and sticking or it may be due to trouble in the mechanical linkage of the starting mechanism. We would suggest that you very carefully watch the action of the starting mechanism and if possible inspect the cut-out switch and see what happens when the starting pedal is operated and also when it is released. You will doubtless find that the operating finger or cam does not work freely and may at times hold the points together or else you will find that the points themselves are burnt and tend to stick together.

It may be that the spring in the cut-out switch is not quite stiff enough and you may be able to improve the action by stiffening this spring. If you cannot detect any tendency for the contacts to stay together it is possible that there is a short circuit between the terminal that is connected to the generator side of motor generator and the terminal that is connected to the battery terminal, which is the large one on the motor generator. To determine this condition it would be well to have the cut-out off of the machine and test it on 110 volts with the points open to see if you can get any connection between the contacts. If you do get a short circuit, as shown by the 110 volt test you can probably locate it by inspection and correct the trouble.

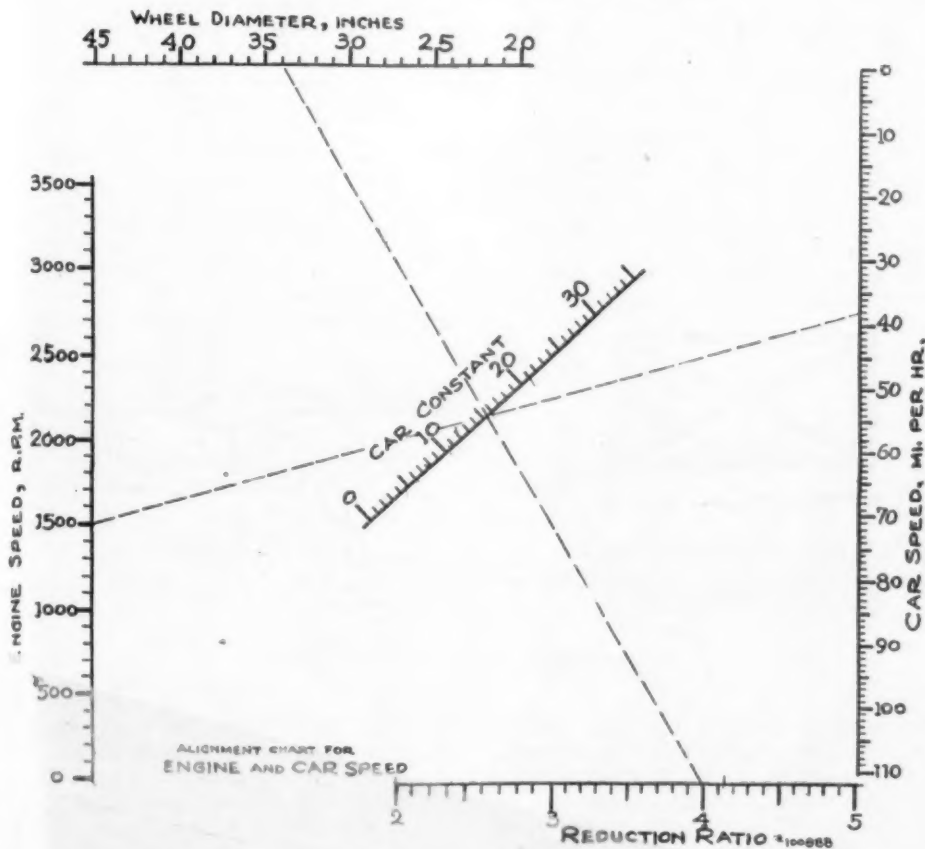


OVERLAND MODEL 83 (1916) WIRING DIAGRAM #00-284

Wiring diagram of model 83 Overland



## Data on Engine Specifications



Q—Is there a chart made that gives the motor speed at miles per hour, also bore, stroke, maximum revolutions, power curve, gear ratio, tire sizes of different cars? If so, send us same at once.—Escanaba Motor Company, Escanaba, Mich.

This is a little too much information to crowd into one chart. We are, however, showing a chart which gives the relation between engine speed, gear ratio, wheel diameter and car speed in miles per hour. The chart is used by drawing a diagonal line from the wheel diameter down to the gear ratio. This line will cross another line in the middle of the chart which is labeled car constant.

A second diagonal line is then drawn from this intersection over to the left so as to meet the point on the vertical

line corresponding to the required engine speed. This same line is extended to the right to the point where it meets the car speed vertical line. The point of intersection shows approximately the number of miles per hour that the car would be traveling under these circumstances. This chart, of course, neglects slippage of the tires which would be approximately 3 per cent at maximum car speed.

The bore and stroke of various cars is given in every issue of *MOTOR AGE* in the specification tables. Data on maximum r.p.m., also power curves are occasionally given although manufacturers often withhold this information from publications.

### SELL ACCESSORY TO MAKE PROFITS

Q—I am a dealer handling a well known make of car. Sales have been fairly good, but I am doing very little better than breaking even. Have had considerable experience in automotive mechanics, and I sometimes wonder if it would not pay me to sell my business and get a job with a reliable company. Can you give me any suggestions for increasing my business, or do you think I would do better by getting my name on a payroll? What kind of job in your opinion offers the best opportunity?

Any information you can give will be appreciated.—A Reader.

We think that you can put your business on a paying basis if you sell accessories to the people who buy cars from you. Every automobile owner is in the market at times for tires, laprobes,

trimmings and other supplies, as well as parts, and the profit from the sale of these articles is well worth while.

Let us assume, for example, that you sell a hundred cars. The accessories and supplies which will be needed for their maintenance will amount to quite a tidy sum and you should attempt to secure some of the additional business which you have created by selling the cars. By letting the public know that you are able to supply these things, you will be rendering a service as well as benefiting yourself.

You might try handling more than one line of cars. This will give your customers a greater variety to select from and you probably will get business that

would not come to you if you sold only one make with a narrow price range.

So far as a job is concerned, there is a demand for district salesmen and also for men to act as service managers for distributors. A good service manager with sales training knows how to keep the public satisfied, and this is a mighty big factor in building any business.

### CAUSE OF SPARK PLUG FOULING

Q—We have a 1918 Buick six model E45. It has been used 8,000 miles and 2½ months ago it began to give trouble due to the spark plugs fouling up. Gill piston rings were installed and run 300 miles but the trouble continued. The fouling has been confined to the second, third and fourth cylinder.—Louis Roncoli, Chicago, Ill.

1—When the piston rings were installed the cylinder walls should have been checked with micrometers, as it is possible they are worn so that they are no longer circular. There should not be a variation of more than .003 in. It is also possible that rings were used that were too large and were cut down at the ends, which does not give a true circle. With the pan removed at the bottom of the engine, we would also suggest inspecting with a trouble lamp while someone turns the engine over slowly.

You can look up into the engine to see if the upper end of the connecting rod is centered in the piston, as it is possible that end play has taken place in the crankshaft and that the connecting rods are clamping the pistons so that they are not allowed to take their natural position in the cylinders, making heavy wear on one upper edge and the opposite lower edge. If this is the case, the rear center main bearing should be replaced, as it controls the crankshaft end play. It is also possible that the plugs are fouling, due to a rich mixture caused by dirt in the carburetor holding the needle open, so that the level of the gasoline is too high.

### REMOVING ROAD TAR TO SAVE FINISH

Q—Advise what will remove tar from a car?—Justice-Miller Auto Co., F. J. Justice, Manager, Ashland, Ky.

Road tar is one of the worst enemies of a fine finish and should be taken off as soon as possible. The tar that has not been allowed to dry can be removed by a local application of a mixture of butter or lard with a small quantity of salt. Take a small amount of it on the finger and rub it on the tar spots so there will be no scratching. This should loosen the tar and allow it to be washed off. No detrimental effect will be noticed if the tar is taken off before it becomes hard, but if allowed to dry it will gradually destroy the finish, eating through the varnish to the wood or metal. If this should occur the only cure is to repaint the car.

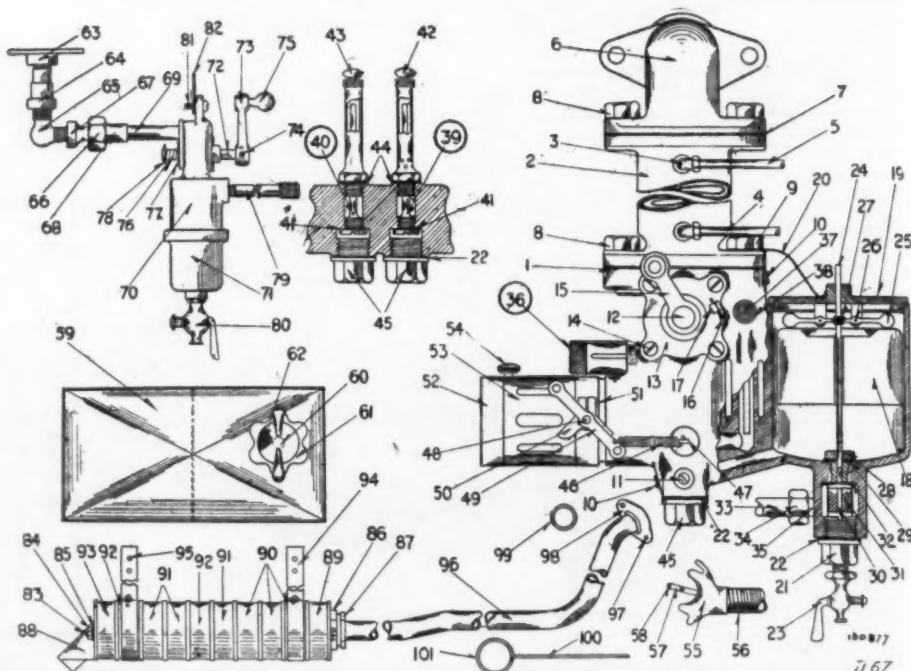
## Lubrication and Carburetion of Model 20 White Truck

Q—Publish lubrication chart of White truck, model 20. Explain the engine oiling system and the amount of oil which is fed to connecting rods and main bearings.

1—We are giving two illustrations which show the lubricating system, one showing the crankshaft and the passage of oil from reservoir through the various pipes to the crankshaft. In this illustration oil is supplied by the reservoir "A" to the pump "C" by which it is forced to the sight feeds at "F". From the sight feeds, the oil travels through tubes "H" and "G" in the direction as indicated by the arrows, to the forward and rear bearings. The oil dropping upon the conical surface of the crankshaft, from "P" and "I", is carried to the connecting rod bearings, "N", "O", "U" and "T", by centrifugal force, through the oil passages "K", "L", "Q" and "R" and the pipes "M" and "S". From the connecting rod bearings the oil is thrown off in a spray, lubricating the cylinder walls, and maintaining the crankcase oil level.

The ball bearings receive lubrication from the splash and some of the oil which is thrown off by the crankshaft. Part of the oil spray which is formed in the crankcase is caught in the troughs "V" and "W" and again carried to the forward and rear bearings.

The feed pipe "I" should be set so that it occupies the position as shown in the drawing. If the pipe is bent back so that the oil drips upon the outer shoulder of the crank, it will be thrown off before it can enter the crankcase. It must be fed to the connecting rods. Care must



Carburetor on model 20 White truck

be taken in bending this pipe so that it does not become kinked or distorted.

The level of the oil in the crankcase can be determined by pulling the release rod "X", which will permit oil to drain through the hole "Y", if the level is up to the proper point. None of the operating parts receive lubrication from the crankcase, as same is used merely to dissipate heat in the case, the bearings being lubricated as described above.

It is therefore very essential that oil is not allowed to attain a higher level

than "Y", as all oil above this point is only splashed around and consumed in the cylinders, forming carbon and fouling plugs. The correct level at "Y" is maintained by the excess of oil which passes through the connecting rod bearings and also by pouring additional oil into the reservoir, "A".

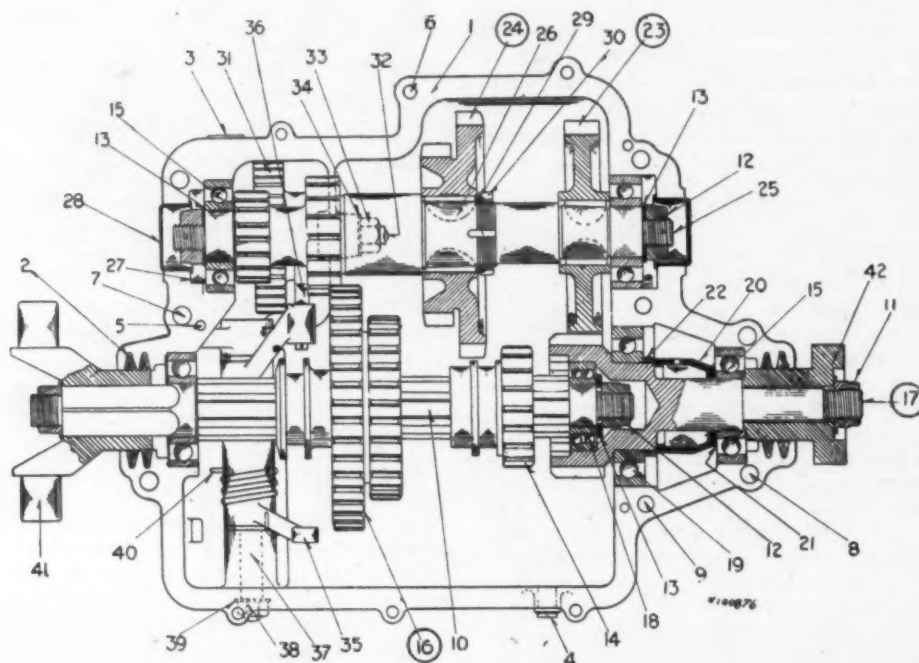
If the sight feed glasses at "F" become full after the engine has warmed up, it is an indication that the oil passages to the bearings are clogged and such a condition should be immediately remedied. The sight feed indicators on the dash show the driver at all times the amount of oil which is being fed. To increase the flow, turn the oil pump adjusting nuts to the left; to decrease it, turn to the right. These nuts are shown in the smaller illustration that gives additional details of the lubricating system.

In making these adjustments see that a proportionate amount of oil (from three to five drops per stroke of the pump) passes through each of the sight feeds. Proper feeding may be interfered with by dirt in the oil pump checks. This condition should be instantly remedied by disconnecting the oil pump line union nuts at the pump end, removing and cleaning the checks. After each 500 miles of travel, drain the crankcase through the drain plug holes, cleanse and refill with new oil.

2—The carburetor on this truck is a White and when running slowly or idling it loads up and there do not seem to be any adjustments. What should be done to prevent loading at low speeds and when idling?

2—An illustration of the carburetor is given in which the part numbers with which we are most concerned are surrounded with circles so as to be more easily found. The trouble being experi-

(Continued on next page)

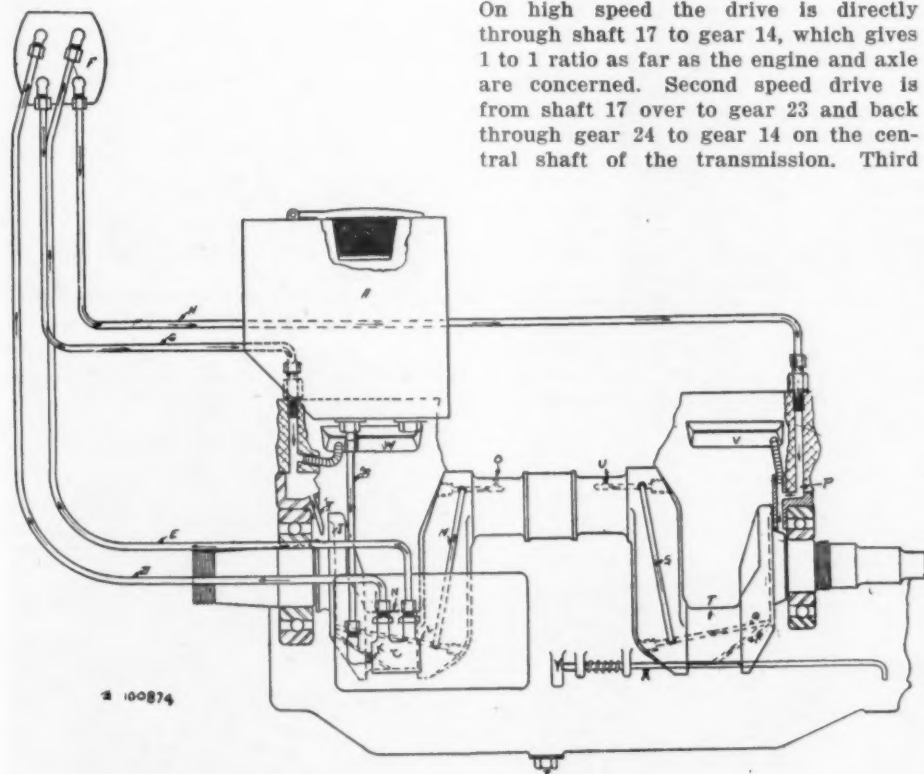


Four speed transmission on model 20 White truck



(Continued from preceding page)

enced is possibly due to the nozzles being unsuitable for the kind of fuel used. The low speed nozzle is found under the air adjusting screw. The air adjusting screw is No. 36 in the illustration and the low speed nozzle is No. 40.



Engine lubrication system on model 20 White truck

If you have both the low speed nozzle No. 40 and the high speed nozzle No. 39 out at the same time you can tell the difference as follows: The low speed nozzle has a hole all the way through the center and in addition has the hole at the side, whereas the high speed nozzle only has the hole going straight through the center. For best results around Chicago the following dimensions have been found satisfactory: On the low speed nozzle the center hole should be .032 diameter, while the hole at the side should be .025. In the high speed nozzle the center hole should be .036 diameter.

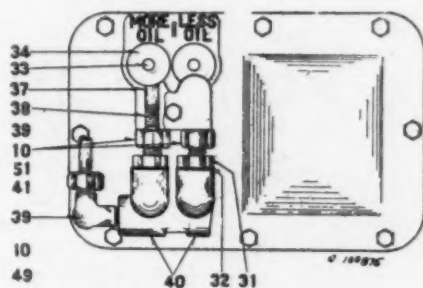
In addition to checking the nozzles it might be well to check the condition of the needle valves and seat. Also see that the weights that operate against the float work freely and work at the same time. Also see that the bearings on which they turn are not worn badly. If the above suggestions do not eliminate the trouble with the carburetor would suggest getting in touch with the White company, Kansas City, Mo., and it is possible that a rebuilt carburetor can be obtained from them. This suggestion is made due to the fact that the carburetor you have may be worn badly and require a complete overhaul.

3—Publish diagram of four speed transmission.—Otto Rosenan, Eudora, Kans.

3—The diagram is published in accordance with your request. Referring to this illustration the right side of the transmission as seen in the cut is the side that connects to the engine so that we can consider No. 17 as the driveshaft. On high speed the drive is directly through shaft 17 to gear 14, which gives 1 to 1 ratio as far as the engine and axle are concerned. Second speed drive is from shaft 17 over to gear 23 and back through gear 24 to gear 14 on the central shaft of the transmission. Third

speed drive is also from shaft 17 to gear 23, then over to the small side of gear 24 and from there to the small side of gear 16, which again brings the drive to the central shaft.

On the extreme low speed the drive is from shaft 17 to gear 23 as before and then back through the small gear to gear 16 on the central shaft. When driving in reverse the drive is transmitted to the two gears shown in the extreme upper left hand corner of the transmission as seen in the illustration. This carries the drive down to gear 31, which gear connects back to the central shaft by means which are not shown in the illustration.



Pressure adjustment on engine oiling system on model 20 White truck

# CALCULATION OF PISTON DISPLACEMENT PER MINUTE BASED ON EACH STROKE

Q—On page 70 of the November 2nd issue, under head, Review of Racing Car Construction, I read something which did not sound just right to me. I refer to the paragraph as follows:

"As an illustration, the 183 in. Duesenberg, straight eight racing engine, delivers 114 hp. at 4250 r.p.m., or its displacement in cubic inches per minute is 183x4250, or 777,750 cu. in. per minute."

Should one multiply the displacement by the r.p.m.? As a four-cycle engine compresses every other revolution, should not the true displacement per minute be computed from the power strokes? True enough, a 183 in. motor will displace its rated number of cubic inches, each revolution, but half of the total will be exhaust gases. It occurs to me the cubic inches per minute should be computed from the power strokes or from the revolutions of the camshaft, as an engine only delivers its full number of power strokes or impulses to each revolution of the camshaft.—J. M. Ravenna, Kerrville, Texas.

1—In computing the piston displacement in cubic inches per minute only the area and the speed of the piston are considered. The fact that both the low speed engine and the high speed engine were rated as to their cubic inch displacement per minute by the same method leaves no room for discussion as far as the relation of the displacement of the low speed to the high speed engine is concerned.

In the paragraph referred to, the analogy was made in order to show that, as the crankshaft speed increases the engine with small bore somewhat approaches the piston displacement per minute of the slower moving large bore engine and the computation was made as printed for the sake of convenience. The ratio of displacement in cubic inches per minute would have been the same if we had used one-half of the engine revolutions per minute, or the camshaft revolutions per minute instead of the crankshaft revolutions.

The meaning of the comparison can be illustrated in a simpler way, as follows: Let us assume that the engines referred to are two punch presses. If the smaller press punches a disk 183 cubic inches in content, at each revolution of its crankshaft, and the other press has a die whose content is 450 inches, the 450-inch press revolves at 2400 r.p.m., the total content of the total number of discs punched by the large press, which will be 2400, will be 2400 times 450. The area of the smaller press revolving at 4250 r.p.m. will be 183 times 4250, which will give exactly the same result as if cubic inch values listed in the article referred to.

We can readily understand your viewpoint and we believe that you have confused the power stroke theory with the total displacement theory, which is the only phase of this situation that was conveyed in the article referred to.

# BOOSTING ACCESSORY SALES

Replacement and new accessory sales for the spring promise to be very good. Dealers, in stocking up to take care of this demand, should be careful, however, not to be the victims of over-buying.

The Hopkins Manufacturing Co., Hanover, Pa., offers wheels made of laminated hardwood. They are said to be interchangeable with wood spoke wheels by releasing the hub flange bolt and substituting the disk for the spokes. They are fitted with demountable rims. The valve tube is accessible. They are made for pneumatic tires from 30x3½ up to 40x8 in. and for single and dual solid tires. The regular 30x3½ wheels are furnished with clincher rims. The price of a set of four in this size is \$42.

These are taper roller bearings for Ford and Chevrolet front wheels and are intended to replace the regular ball bearings. A set consists of four bearings. They are the product of the Wm. H. Pratt Manufacturing Co., Chicago, Ill.

The Ledix semaphore, made by Dickinson & Co., Minneapolis, Minn., combines a signal conforming to ordinances relating to stopping and turning, a parking light and reflectors. The parking light comes into use when the arrow is pointed downward. It is made of polished aluminum and nicked brass. It can be attached to both open and closed cars. By setting the signal on approaching a turn, both hands are left free for the steering wheel. It is operated by a small control handle within easy reach of the driver.

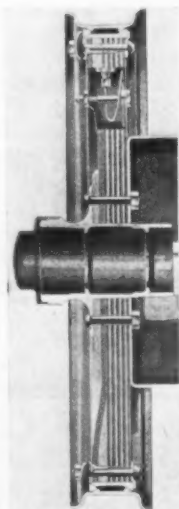
The Menger Mfg. Co., Inc., New York, offers a simple lock fitted with a Yale key. It is said to resist hacksaw, file, bolt clippers, chisel and jimmy or any other tools that might be used in an attempt to break it. The lock can be had with or without chain. The price, \$7, includes a 24-in. chain.

This new type of bumper arm as shown above bolts rigidly to the frame by using a bolt through the snubber hole, and the outside rear bolt, which fastens the spring to the frame.

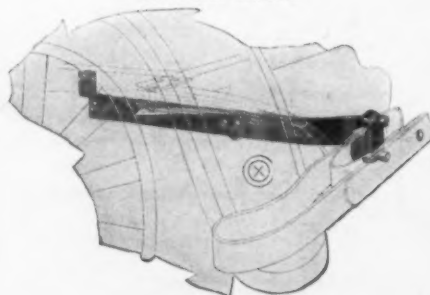
The brace which fastens to the outside rear body bolt is extended toward the rear 6 inches to give greater leverage, and bring the support as near the bumper rail as possible, this extended brace also prevents side vibration.

This new bracket is not fastened to the gas tank support or the spring and any shock is transmitted directly to the frame, as there are no holes to drill or no alterations to make, the installation of the complete bumper can be made in twenty minutes.

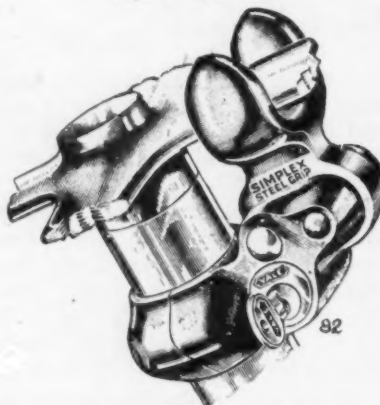
An aluminum step plate, the product of McAllister Bros., is being marketed by the Lovejoy Sales Co., Jacksonville, Fla. The plate is cast aluminum alloy, highly polished and laquered to keep the finish. A feature of the plate is the streamline mud scraper which conforms to the running board moulding. They list at \$2.50 each.



Curvdisc wheels



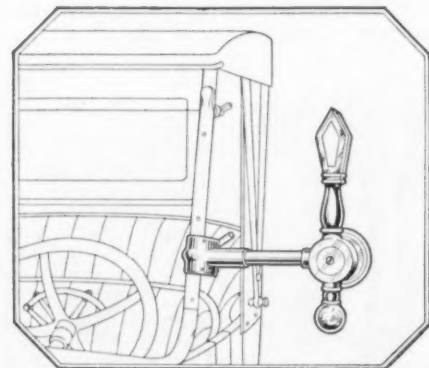
Cox bumper arm



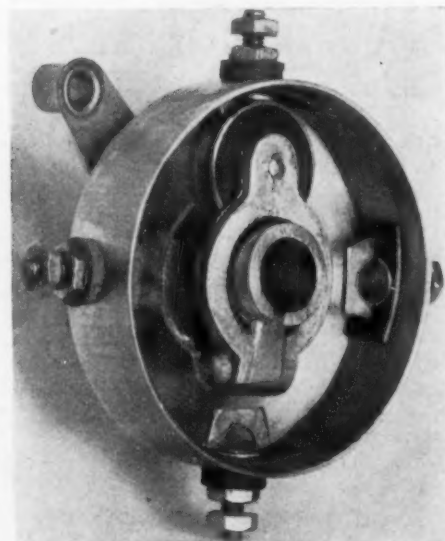
Simplex steel grip lock

This bumper arm can be used with snubbers by using the cap screw furnished with the snubbers instead of the bolt and nut furnished with the bumper. Cox Brass Mfg. Co., Albany, N. Y.

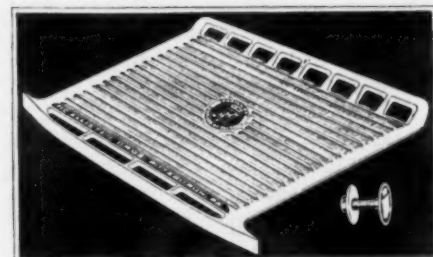
One of the recent additions to the timer field is the Fasco, the feature of which is the knife-switch-like contact of the roller and contact points in the shell. All wearing parts of this timer such as the roller are monel metal. The roller is mounted on a hinged fork which is fastened by a rivet to a collar which slips over the camshaft and is fastened to it by a pin in the usual manner. The shell is drawn from 1/16-in. metal and allows conventional practice excepting in the case of the contact points. The timer is made by the Fasco Mfg. Co., 3700 Lake



Ledix semaphore



Fasco timer



McAllister aluminum step plates

Park avenue, Chicago. The price is said to compare with that of other timers for Fords.

Blue-Tip Transmission Lining for Fords consists of three lengths of brake lining, each length of a different type best adapted for the work it has to do. The reverse lining is 48 picks, the slow speed is extra heavy and the brake is asbestos. The set is furnished in a carton, complete with the necessary rivets. Libby Mfg. Co., 111-121 Watchung avenue, Plainfield, N. J. Price \$2.50 per set.

Simplex Steel Grip Lock is made by the Simplex Corp., 2214 Michigan avenue, Chicago, and sells for \$15. The cut shows the rigidity and action of the lock.



## Unusual Display Window Design Reveals Interior to Full Extent

A VERY novel display room and one which attracts more attention than its 50 ft. frontage warrants, has recently been occupied by the Peerless Co. of Chicago.

As will be seen by a glance at the sketch plan, instead of a straight expanse of glass across the front from wall to wall, a very deep bay window effect has been attained which gives the window shopper an opportunity to inspect the car on display from three sides without entering the show room. Whether this phase is an advantage or not, is questionable, but aside from this the displaying qualities of the window are far ahead of the ordinary type and give almost the effect of a corner.

There is a row of powerful electric lamps in various colors around the top

of the window, so that light can be directed onto the exhibit at night and the night use of the window is its greatest value.

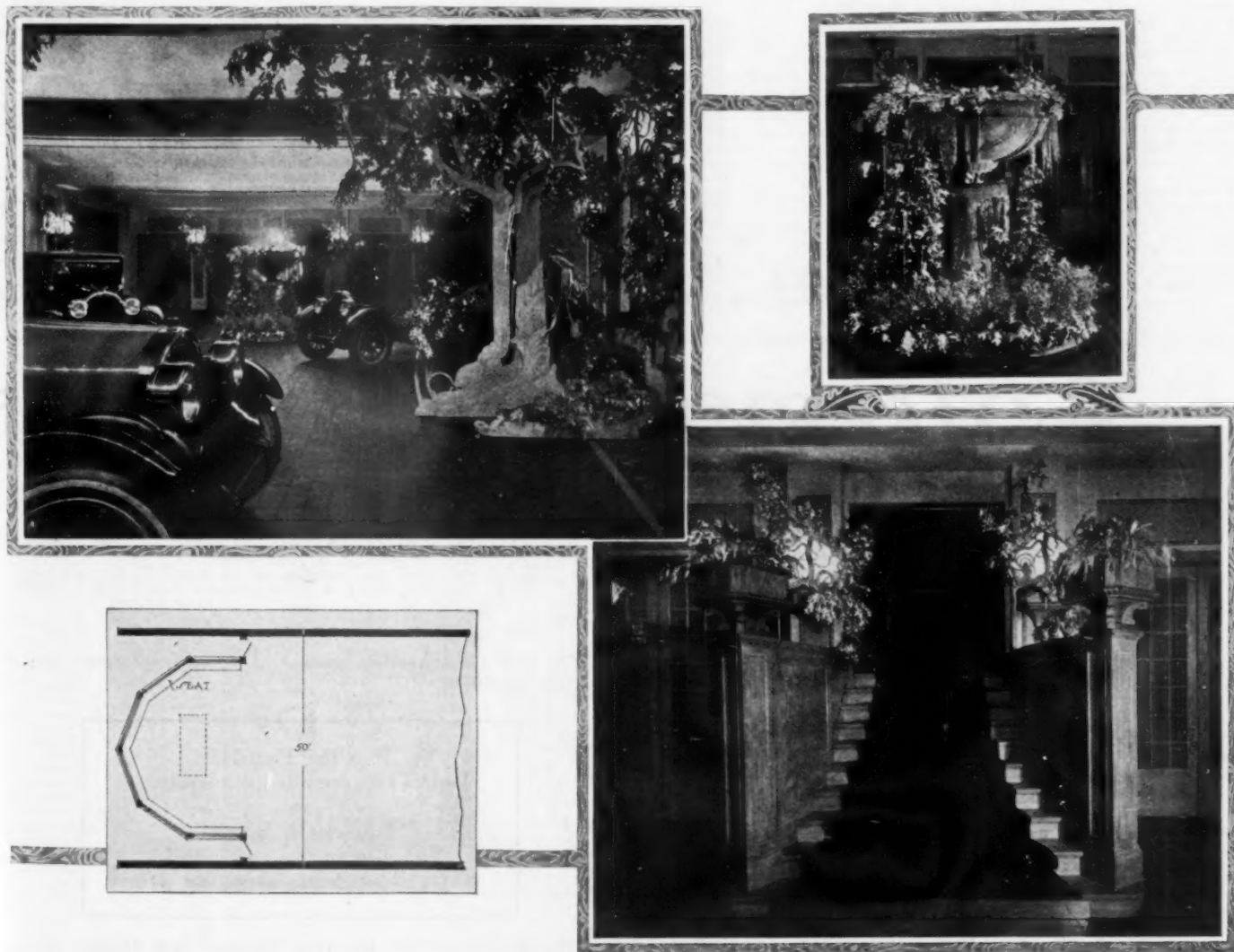
During the recent fall exhibit in which closed cars were pushed by all the Chicago dealers, the room behind this window was very elaborately decorated with autumn foliage combined with hangings of tinsel and brilliant colors, ranging from cerise to deep purple. Our photographs of the interior were taken at this time, but of course give no hint of the effect of brilliant, harmonious color. The motorist or pedestrian passing on Michigan boulevard could scarcely miss seeing it, especially when set off by a window of this sort.

Fronts of this kind are frequently used by dealers in women's apparel and also

by haberdashers, where window space is limited and it is desired to display a quantity of goods, but we have never known of anything of the sort being used for the display of automobiles.

It has one great advantage over the ordinary window, on a boulevard or street extensively used, in the evening, by pedestrians and promenaders. During the evening hours, when the show room is closed, anyone interested may walk almost completely around the car displayed, getting a view of it from front, side and rear.

There are, of course, places where such a show window would be of no value, but where the building is narrow and in the middle of the block there is much to be gained by the arrangement.



View of the show room looking back from the front window. This shows the autumn decorations and in the distance may be seen the electric fountain, shown in detail at the right. Back of the fountain is the stairway leading to the office on the second floor. The doors at the left of the stairway lead to the garage while the others lead to closing rooms and sales offices

# COMING MOTOR EVENTS

## AUTOMOBILE SHOWS

Chicago	Annual Show at Coliseum, N. A. C. C.	Jan. 27-Feb. 3
Chicago	Annual Automobile Salon	Jan. 27-Feb. 3
Binghamton, N. Y.	Annual Automobile Show	Jan. 29-Feb. 3
Ann Arbor, Mich.	Annual Automobile Show	Jan. 29-Feb. 3
Wilkes-Barre, Pa.	Annual Automobile Show	Jan. 29-Feb. 3
Wilmington, Del.	Annual Automobile Show	Jan. 29-Feb. 3
Middletown, N. Y.	Annual Automobile Show	Jan. 30-Feb. 3
Portland, Ore.	Annual Automobile Show	Feb. 3-10
Pittsburgh	Annual Automobile Show	Feb. 3-10
Minneapolis, Minn.	Annual Show	Feb. 3-10
Troy, N. Y.	Annual Automobile Show	Feb. 3-10
Allentown, Pa.	Semi-Annual Automobile Show	Feb. 3-17
Winnipeg, Man.	Annual Automotive Equipment Show	Feb. 5-10
Charlotte, N. C.	Annual Automobile Show	Feb. 5-10
Lansing, Mich.	Annual Automobile Show	Feb. 5-10
Toledo	Annual Automobile Show	Feb. 5-10
Winnipeg, Man.	At Minto Barracks	Feb. 5-12
Waterbury, Conn.	Annual Automobile Show	Feb. 5-12
Salisbury, Md.	Annual Automobile Show	Feb. 6-10
Galesburg, Ill.	Annual Show	Mar. 6-10
Cincinnati	Automobile Show	Feb. 7-14
New Brighton, Pa.	At Junction Park	Feb. 7-14
Kewanee, Ill.	Kewanee Automobile Dealers' Assn.	Feb. 8-10
Kansas City, Mo.	Annual Automobile Show	Feb. 10-17
St. Louis	St. Louis Automobile Dealers' Assn.	Feb. 10-17
Norfolk, Va.	Annual Automobile Show	Feb. 12-17
Kalamazoo	Annual Automobile Show	Feb. 12-17
Utica, N. Y.	Annual Automobile Show	Feb. 12-17
Dallas, Texas	Dallas Automobile Trades Assn. Show	Feb. 12-17
Flint, Mich.	Flint Dealers' Assn.	Feb. 12-17
Fort Dodge, Ia.	Annual Automobile Show	Feb. 13-16
Orlando, Fla.	Annual Automobile Show	Feb. 13-17
Sioux Falls, S. D.	Annual Automobile Show	Feb. 14-17
Ottawa, Canada	Show	Feb. 15-17
Columbus	Annual Automobile Show	Feb. 15-21
Hartford, Conn.	Annual Automobile Show	Feb. 17-24
Atlanta	Annual Automobile Show	Feb. 17-24
Akron, O.	At Central Garage	Feb. 17-24
San Francisco	Exposition, Auditorium	Feb. 17-24
Sioux City, Ia.	Sioux City Automobile Dealers' Assn.	Feb. 17-24
Salt Lake City	Annual Automobile Show	Feb. 19-29
Grand Rapids, Mich.	Annual Automobile Show	Feb. 19-24
Mt. Clemens, Mich.	Annual Automobile Show	Feb. 19-24
Louisville	Annual Automobile Show	Feb. 19-24
White Plains, N. Y.	Annual Automobile Show	Feb. 19-24
Schenectady, N. Y.	Annual Automobile Show	Feb. 19-24
Springfield, O.	At Memorial Hall	Feb. 19-25
Bethlehem, Pa.	Annual Automobile Show	Feb. 19-Mar. 1
Trenton, N. J.	Annual Automobile Show	Feb. 21-24
Springfield, Ill.	Springfield Automobile Dealers' Assn.	Feb. 22-24
Brooklyn, N. Y.	Annual Automobile Show of the Brooklyn Motor Vehicle Dealers' Assn.	Feb. 24-Mar. 3

Youngstown, O.	Youngstown Automobile Dealers' Assn.	Feb. 24-Mar. 3
Albany, N. Y.	Annual Automobile Show	Feb. 24-Mar. 3
Des Moines, Iowa	Annual Show	Feb. 25-Mar. 5
Chicago	South Mid-Town Automobile Show	Feb. 26-Mar. 3
Muskegon, Mich.	Annual Automobile Show	Feb. 26-Mar. 3
Syracuse, N. Y.	Annual Automobile Show	Feb. 26-Mar. 3
Springfield, Mass.	Annual Automobile Show	Feb. 26-Mar. 3
Omaha	Annual Automobile Show	Feb. 26-Mar. 3
Yonkers	Annual Automobile Show	Feb. 26-Mar. 3
Oklahoma City	Annual Automobile Show	Feb. 26-Mar. 3
Portland, Me.	Annual Automobile Show	Feb. 26-Mar. 3
Evansville, Ind.	Annual Automobile Show	Feb. 26-Mar. 3
Malone, N. Y.	Annual Automobile Show	Feb. 28-Mar. 3
Poughkeepsie, N. Y.	Annual Automobile Show	Feb. 28-Mar. 3
Mankato, Minn.	Mankato Automobile Assn.	Feb. 28-Mar. 4
Indianapolis	Indianapolis Trade Association	Mar. 5-10
Bay City, Mich.	Duluth Automotive Dealers' Assn.	Mar. 5-10
Duluth, Minn.	Annual Automobile Show	Mar. 5-10
Amsterdam, N. Y.	Annual Automobile Show	Mar. 5-10
Carlisle, Pa.	Chamber of Commerce Show	Mar. 5-10
Nashville, Tenn.	Annual Automobile Show	Mar. 5-11
Saginaw, Mich.	Annual Automobile Show	Mar. 7-11
Elizabeth, N. J.	Fifth Annual Show	Mar. 8-17
Huntington, W. Va.	Huntington Automobile Dealers' Assn. Show	Mar. 10-16
Richmond, Va.	Annual Automobile Show	Mar. 10-17
Boston	Annual Automobile Show	Mar. 10-17
Newark, N. J.	Annual Automobile Show	Mar. 10-17
Washington, D. C.	Spring Show, Convention Hall	Mar. 11-17
Port Huron, Mich.	Annual Automobile Show	Mar. 12-17
Jacksonville, Ill.	Jacksonville Automobile Dealers' Assn.	Mar. 12-17
Denver, Colo.	Denver Automobile Dealers' Show	Mar. 14-17
Battle Creek, Mich.	Annual Automobile Show	Mar. 19-24
Greenville, S. C.	Annual Automobile Show	Mar. 28-31
Denver	Municipal Auditorium	Mar. 11-18
Alpena, Mich.	Annual Automobile Show	Apr. 2-7
Green Bay, Wis.	Annual Automobile Show	Aug. 27-30
Sacramento	Annual Automobile Show	Sept. 3-8
Memphis	Annual Automobile Show	Sept. 28-30
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Waco, Texas	Waco Automobile Dealers' Assn.	Oct. 20-Nov. 5

## CONVENTIONS

Chicago	Annual Meeting, Automotive Electric Service Association	Jan. 29-31
Quincy, Ill.	Annual Meeting Illinois Automotive Trade Association	Mar. 19
Olympia, Wash.	Convention Washington Automotive Trade Association	July

## RACES

Indianapolis	Annual 500-Mile Classic	May 30
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# SQUEEKS & RATTLES

If You Know Any, Tell Them to Us

### At the Show

There were lots of things at the auto show,  
The silk and satin and calico;  
The cars lined up, the salesmen, too,  
The spirit: "Better than '22."

An automobile stage was speeding along a narrow winding road over Montara Mountain. A tourist did not like the look of the many gulches and after rounding a sharp turn his nervousness overcame him and he turned to the driver.

"Say," he asked, "have we got any more turns like that?"

"Well," answered the driver, as he gave it more gas, "we have one more up here a bit where the radiator will rub the spare tire."—Prize Story in Judge.

Every day down the highway  
I am going faster and faster,  
Until at last, in a great crash  
I epd: with a doctor, nurse and  
plaster.

—Harmon Hoag.

The road is straight and the motor's right  
A railroad crossing looms in sight,  
The sign said look, listen and stop,  
But the motorist, he said not.  
The train was speeding on its way,  
They sent him flowers the following day.  
Prest-O-Lite.

The \$500 car is now as common as the five-cent cigar—used to be.—R. L. Miller.

Join the Family!  
Unless you are a regular contrib.  
to  
"Squeeks & Rattles"  
You aint in the automobile  
business

"On Mullan's Pass between Montana and Idaho," writes Sherman Foster of Oklahoma City, "which is the worst climb I found on a recent trip to Seattle, there is a sign, neatly worded, which reads: 'Speed limit on this pass 75 miles per hour—Fords, do your damndest!'"



## Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive			
				Front	Rear					Front	Rear					Front	Rear			
Ace.....30	11-13	\$2400	3 1/2 x 5	34x3 1/2	34x6	W	Corbitt.....B-22	2 1/2	\$3000	4 1/2 x 5 1/2	36x4	36x7	W	Gersix.....K	2 1/2	\$3500	4 1/2 x 5 1/2	36x4	36x8	W
Ace.....40	13-15	2850	4 1/2 x 5 1/2	36x4	36x7	W	Corbitt.....R-22	3	3200	4 1/2 x 5 1/2	36x4	36x8	W	Gersix.....3 1/2	3 1/2	4500	4 1/2 x 5 1/2	36x5	40x12	W
Ace.....60	15-17	3400	4 1/2 x 5 1/2	36x4	36x8	W	Corbitt.....A-22	3 1/2	3800	4 1/2 x 5 1/2	36x5	36x10	W	Gottfredson.....20	1	2075	3 1/2 x 5 1/2	34x5	34x5	W
Acme.....20	1	.....	3 1/2 x 5	35x5 1/2	35x5 1/2	W	Corbitt.....AA-22	5	4500	4 1/2 x 6	36x6	40x6	W	Gottfredson.....31	1 1/2-2	3000	4 x 5 1/2	36x6	38x7 1/2	W
Acme.....30	1 1/2	.....	3 1/2 x 5	34x3 1/2	34x5	W	Day-Elder.....AS	1	1600	3 1/2 x 5	35x5 1/2	35x5 1/2	W	Gottfredson.....A	2 1/2	3375	4 x 5 1/2	36x4	36x7	W
Acme.....40	2	.....	3 1/2 x 5	34x3 1/2	34x5	W	Day-Elder.....B	1 1/2	2000	3 1/2 x 5	34x3 1/2	34x5	W	Gottfredson.....B	3 1/2-4	4475	5 x 6 1/2	36x5	36x10	W
Acme.....60	3	.....	4 1/2 x 5 1/2	36x4	36x7	W	Day-Elder.....C	2 1/2	2750	4 1/2 x 5 1/2	36x4	36x7	W	Gottfredson.....100	5-6	5500	5 x 6 1/2	36x6	40x14	W
Acme.....90	4 1/2	.....	4 1/2 x 5 1/2	36x4	36x7 1/2	W	Day-Elder.....D	2 1/2	2400	4 1/2 x 5 1/2	36x4	36x7	W	Graham Bros.....1	1	1265	3 1/2 x 4 1/2	33x4 1/2	34x5 1/2	B
Acme.....125	6 1/2	.....	4 1/2 x 6	36x6	40x12	W	Day-Elder.....E	3	3150	4 1/2 x 5 1/2	36x5	36x5 1/2	W	Graham Bros.....1 1/2	1 1/2	1325	3 1/2 x 4 1/2	33x4 1/2	36x6 1/2	B
American.....25	2 1/2	3350	4 x 6	36x4 1/2	36x4 1/2	W	Day-Elder.....F	3 1/2	3150	4 1/2 x 5 1/2	36x5	36x5 1/2	W	Graham-Pion.....10	1	1245	3 1/2 x 5	33x5	33x5 1/2	B
American.....40	4	4275	4 1/2 x 6	36x5 1/2	36x5 1/2	W	Day-Elder.....G	4	4250	4 1/2 x 6	36x5 1/2	40x6 1/2	W	Graham-Pion.....15	1 1/2-2	1750a	3 1/2 x 5	36x3 1/2	36x5 1/2	I
American.....50	5	4500	4 1/2 x 6	36x5 1/2	36x12	W	Day-Elder.....H	5	4500	4 1/2 x 6	36x5 1/2	40x6 1/2	W	Graham-Pion.....65	1 1/2-2	2250a	4 1/2 x 5 1/2	36x4 1/2	36x5 1/2	W
Armleder.....20	1	.....	3 1/2 x 5 1/2	34x3 1/2	34x6 1/2	W	Dearborn.....E	1	1600	3 1/2 x 5 1/2	35x5 1/2	35x5 1/2	W	Graham-Pion.....20	2-2 1/2	2475a	4 1/2 x 5 1/2	36x4 1/2	36x5 1/2	W
Armleder.....21	1 1/2	.....	3 1/2 x 5 1/2	34x3 1/2	34x6 1/2	W	Dearborn.....FX	1 1/2	2300	3 1/2 x 5 1/2	34x4	34x5	W	Graham-Pion.....30	3	3300a	4 1/2 x 5 1/2	36x5 1/2	36x5 1/2	W
Armleder.....40-B	1 1/2	.....	4 1/2 x 5 1/2	34x3 1/2	34x6 1/2	W	Dearborn.....F	1 1/2	2180	3 1/2 x 5 1/2	34x4	34x5	W	Graham-Pion.....75P	3 1/2	4225a	4 1/2 x 5 1/2	36x6 1/2	42x6 1/2	W
Armleder.....40-C	1 1/2	.....	4 1/2 x 5 1/2	34x3 1/2	34x6 1/2	W	Dearborn.....G	2	2590	3 1/2 x 5 1/2	34x4 1/2	34x7	W	Graham-Pion.....40	4	3850a	4 1/2 x 5 1/2	36x5	36x5 1/2	W
Armleder.....HW-B	2 1/2	.....	4 1/2 x 5 1/2	36x4 1/2	36x7 1/2	W	Defiance.....48	2	2590	3 1/2 x 5 1/2	34x4 1/2	34x7	W	Graham-Pion.....50	5-6	4450a	4 1/2 x 6	36x6	40x6 1/2	W
Armleder.....HW-C	2 1/2	.....	4 1/2 x 5 1/2	36x4 1/2	36x7 1/2	W	Defiance.....G	1	1525	3 1/2 x 5	35x5 1/2	35x5 1/2	B	Hall.....1 1/2	1 1/2	3100	3 1/2 x 5	34x5 1/2	38x7 1/2	W
Armleder.....KW-B	3 1/2	.....	4 1/2 x 6	36x5 1/2	36x5 1/2	W	Defiance.....D	1 1/2	1845	3 1/2 x 5	35x5 1/2	36x8 1/2	I	Hall.....2 1/2	2 1/2	3275	4 1/2 x 5 1/2	36x4	36x6	W
Armleder.....KW-C	3 1/2	.....	4 1/2 x 5 1/2	36x5 1/2	36x5 1/2	W	Defiance.....E	2	2075	3 1/2 x 5	35x5 1/2	36x8 1/2	I	Hall.....3 1/2	3 1/2	4100	4 1/2 x 5 1/2	36x5	36x5 1/2	W
*Atlas.....22	1 1/2	1495	3 1/2 x 5 1/2	34x4 1/2	34x4 1/2	W	Denby.....31	1 1/2	1485	3 1/2 x 5	35x5 1/2	35x5 1/2	B	Hall.....5	5	5100	4 1/2 x 5 1/2	36x5	40x6 1/2	C
*Atlas.....44	1 1/2-2	1950	3 1/2 x 5 1/2	36x6 1/2	36x6 1/2	W	Denby.....33	1 1/2	2145	3 1/2 x 5	35x5 1/2	36x8 1/2	I	Hall.....7 chain	7	5100	4 1/2 x 5 1/2	36x5	40x6 1/2	C
Atterbury.....20R	1 1/2	2475	3 1/2 x 5	34x3 1/2	34x5	W	Denby.....35	2 1/2	2795	4 1/2 x 5 1/2	36x4	36x7	I	Harvey.....W OA	2	2650	4 1/2 x 5 1/2	34x4	34x7	W
Atterbury.....22C	2 1/2	3375	4 1/2 x 5 1/2	36x4	36x4 1/2	W	Dependable.....A	1 1/2	1650	3 1/2 x 5 1/2	34x5 1/2	34x5	W	Harvey.....WHA	3 1/2	3950	4 1/2 x 6	36x5	36x5 1/2	W
Atterbury.....22C	2 1/2	3475	4 1/2 x 5 1/2	36x4	36x4 1/2	W	Dependable.....C	2	2350	3 1/2 x 5 1/2	34x3 1/2	34x5	W	Hawkeye.....O	1	1375	3 1/2 x 5 1/2	34x5 1/2	34x5 1/2	I
Atterbury.....22D	3 1/2	4275	4 1/2 x 5 1/2	36x5	40x5 1/2	W	Dependable.....D	2 1/2	2650	4 x 5 1/2	34x5	36x6	W	Hawkeye.....K	1 1/2	1645	3 1/2 x 5 1/2	34x3 1/2	34x5 1/2	I
Atterbury.....22D	3 1/2	4375	4 1/2 x 5 1/2	36x5	40x5 1/2	W	Dependable.....E	3	2950	4 1/2 x 5 1/2	36x4	36x7	W	Hawkeye.....M	2	2145	4 1/2 x 5	36x4 1/2	36x6 1/2	I
Atterbury.....8E	5	4975	4 1/2 x 6	36x5	40x6 1/2	W	Diamond T.....O-3	1-1 1/2	1975	3 1/2 x 5 1/2	36x3 1/2	36x4 1/2	W	Hawkeye.....N	3 1/2	3700	4 1/2 x 6 1/2	36x5 1/2	36x10 1/2	I
Atterbury.....8E	5	5125	4 1/2 x 6	36x5	40x6 1/2	W	Diamond T.....T	1 1/2	2250	3 1/2 x 5 1/2	36x3 1/2	36x5	W	Hendrickson.....O	1 1/2	2200	3 1/2 x 5 1/2	36x4 1/2	36x5 1/2	W
Autocar.....21UG	1 1/2-2	2200	3 1/2 x 5 1/2	34x4 1/2	34x6	D	Diamond T.....U	2-2 1/2	2650	4 x 5 1/2	36x4	36x7	W	Hendrickson.....N	2 1/2	2690	4 1/2 x 5 1/2	36x4 1/2	36x7 1/2	W
Autocar.....21UG	1 1/2-2	2300	3 1/2 x 5 1/2	34x4 1/2	34x6	D	Diamond T.....K	3 1/2	3750	4 1/2 x 5 1/2	36x5	36x5 1/2	W	Hendrickson.....M	3 1/2	3000	4 1/2 x 5 1/2	36x5 1/2	36x5 1/2	W
Autocar.....27H	2-3	3100	4 x 5 1/2	34x5	36x7	D	Doane.....2 1/2	2 1/2	4100b	4 1/2 x 5 1/2	36x5	36x7	C	Hendrickson.....K	5	4000	5 x 6 1/2	36x6	40x6	W
Autocar.....27K	2-3	3200	4 x 5 1/2	34x5	36x7 1/2	D	Doane.....3 1/2	3 1/2	5100b	4 1/2 x 5 1/2	36x5	36x5 1/2	C	Huffman.....B	1 1/2-2	1795	3 1/2 x 5	34x3 1/2	34x6	W
Autocar.....26Y	4-6	4200	4 1/2 x 5 1/2	34x6	36x12	D	Doane.....6	6	6000b	5 x 6 1/2	36x6	40x6 1/2	C	Huffman.....C	1 1/2-2	1695	3 1/2 x 5 1/2	34x3 1/2	34x6	I
Available.....H1 1/2	1 1/2	2475	4 x 5	36x3 1/2	36x5 1/2	W	*Dodge Brothers.....9 1/2	9 1/2	730	3 1/2 x 5 1/2	32x4 1/2	32x4 1/2	B	Hurlburt.....A-A	1-1 1/2	1950	3 1/2 x 5	34x5 1/2	34x5 1/2	W
Available.....H2	2	2775	4 x 5	36x3 1/2	36x6 1/2	W	Dorris.....K-2	1	2490	4 x 5 1/2	32x4 1/2	32x4 1/2	B	Hurlburt.....B-B	2-2 1/2	2800	4 1/2 x 5 1/2	36x4	36x4 1/2	W
Available.....H2 1/2	2 1/2	3160	4 x 5	36x4 1/2	36x6 1/2	W	Dorris.....K-4	2-2 1/2	3400	4 1/2 x 5 1/2	36x4	36x7	W	Hurlburt.....C-C	3-3 1/2	3475	4 1/2 x 5 1/2	36x5	36x5 1/2	W
Available.....H3 1/2	3 1/2	4175	4 1/2 x 5 1/2	36x5	40x5 1/2	W	Dorris.....K-7	3 1/2	4400	4 1/2 x 5 1/2	36x5	36x10	W	Hurlburt.....D-D	4-4 1/2	4150	4 1/2 x 6	36x5	36x6 1/2	W
Available.....H5	5	5375	5 x 6	36x6	40x12	W	*Dort.....103	103	685a	3 1/2 x 5 1/2	31x4 1/2	34x4 1/2	B	Hurlburt.....E-E	6-6 1/2	4850	4 1/2 x 6 1/2	36x6	40x6 1/2	W
*Avery.....1	1	.....	3 x 4 1/2	34x5 1/2	34x5 1/2	I	Double Drive.....B	3	4000	4 1/2 x 5 1/2	36x6	36x6	W	Indep'd't (Iowa).....B	1	1665	3 1/2 x 5	34x3 1/2	34x4	I
Beck.....A Jr.	1 1/2	1285a	3 1/2 x 5	34x4 1/2	34x4 1/2	I	Duplex.....A	2	2775	4 x 5 1/2	35x5	38x7 1/2	W	Indep'd't (Iowa).....G	1 1/2	2040	4 1/2 x 5 1/2	34x3 1/2	34x5	I
Beck.....B-30	1 1/2	1350	3 1/2 x 5	34x5	36x6	I	Duplex.....E	3 1/2	3500	4 1/2 x 5 1/2	36x8	36x8	W	Indep'd't (Iowa).....HI	2 1/2	2940	4 1/2 x 5 1/2	36x4	36x7	W
Beck.....C-40	2	1550	3 1/2 x 5	36x6	36x6	I	Duty.....22	2	1500	3 1/2 x 5	34x3 1/2	34x5	I	*Indiana.....10	1	.....	3 1/2 x 5 1/2	34x5 1/2	34x5 1/2	B
Beck.....D-50	2 1/2	1950	4 1/2 x 5 1/2	38x7	40x8	W	Eagle.....101	1 1/2	1875	3 1/2 x 5 1/2	34x5	34x5	I	Indiana.....12	1 1/2-2	.....	3 1/2 x 5 1/2	34x3 1/2	34x5 1/2	W
Bell.....M (Iowa)	1 1/2	1495	3 1/2 x 5 1/2	35x5	35x5 1/2	W	Eagle.....100-2	2	2275	3 1/2 x 5 1/2	34x4 1/2	34x7 1/2	I	Indiana.....20	2	.....	4 1/2 x 5 1/2	36x4 1/2	3	

## Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive
				Front Rear						Front Rear						Front Rear	
Kleiber.....BB	2	\$3600	4 1/2 x 5 1/2	36x4k 36x7k	W	Ogden.....A2	1	.....	3 1/2 x 5	34x5n 34x5n	W	Selden.....90	5-7	\$1950	4 1/2 x 6	36x6 40x12	W
Kleiber.....B	2 1/2	3950	4 1/2 x 5 1/2	36x5k 36x8	W	Ogden.....D	1 1/2	.....	3 1/2 x 5	36x3 1/2 36x5	W	Sinaca.....M	2 1/2	820	3 1/2 x 4 1/2	30x3 1/2 30x3 1/2	B
Kleiber.....C	3 1/2	4600	4 1/2 x 5 1/2	36x5 36x5 1/2	W	Ogden.....E	2 1/2	.....	3 1/2 x 5	36x3 1/2 36x4k	W	*Service.....12	2 1/2	.....	3 1/2 x 4 1/2	32x4 1/2 32x4 1/2	B
Kleiber.....D	5	5300	5 x 6 1/2	36x6 40x12	W	Old Reliable.....A	1 1/2	\$2350	4 x 5	34x4 36x6	W	*Service.....25	1 1/2	.....	3 1/2 x 5 1/2	34x5n 34x5n	B
Koehler.....D	1 1/2	2150	3 1/2 x 5	34x3 1/2 34x5	W	Old Reliable.....B	2	3500	4 1/2 x 6	34x4 36x4d	W	*Service.....21	1 1/2	.....	3 1/2 x 5 1/2	34x5 1/2 34x5	W
Koehler.....M	2 1/2	3175	4 x 5 1/2	36x4 36x7	W	Old Reliable.....C	3 1/2	4250	4 1/2 x 6	36x5 36x5d	W	*Service.....32	2	.....	4 x 5 1/2	36x3 1/2 36x7	W
Koehler.....MCS	2 1/2	3275	4 1/2 x 5 1/2	36x4 36x7	W	Old Reliable.....D	5	5000	4 1/2 x 6	36x6 40x6d	W	*Service.....37	2	.....	4 1/2 x 5 1/2	35x5n 38x7n	W
Koehler.....F	3 1/2	4470	4 1/2 x 5 1/2	36x5 36x10	W	Old Reliable KLM	7	6000	4 1/2 x 6 1/2	36x6 40x7d	C	*Service.....52	3	.....	4 1/2 x 5 1/2	36x4 36x8	W
Koehler, MT. Trac	5	3275	4 1/2 x 5 1/2	36x4 36x7	W	*Oldsmobile Econ	1	1095	3 1/2 x 5 1/2	35x5n 35x5n	I	*Service.....72	3 1/2	.....	4 1/2 x 5 1/2	36x5 36x5d	W
Krebs.....23	3 1/2	1360	3 1/2 x 5	34x4 1/2 34x4 1/2	W	Olympic.....A	2 1/2	3200	4 1/2 x 5 1/2	36x4 36x8	W	*Service.....77	4	.....	4 1/2 x 5 1/2	36x5 36x5d	W
Krebs.....24	1	1675	3 1/2 x 5	34x5 34x5	W	Onsida.....B9	1 1/2	2825	4 x 5 1/2	36x3 1/2 36x7	W	*Service.....102	6	.....	4 1/2 x 5 1/2	36x6 40x6d	W
Krebs.....45	1 1/2	2275	4 1/2 x 5 1/2	36x4 36x7	W	Onsida.....C9	2 1/2	3200	4 x 5 1/2	36x4 36x8	W	Signal.....NF	1	.....	3 1/2 x 5	34x5n 36x6n	W
Krebs.....75	2 1/2	2550	4 1/2 x 5 1/2	36x4 36x8	W	Onsida.....D9	3 1/2	4050	4 1/2 x 5 1/2	36x5 36x10	W	Signal.....H	1 1/2	.....	4 1/2 x 5 1/2	34x4 36x6	W
Krebs.....110	3 1/2	3175	4 1/2 x 5 1/2	36x5 40x10	W	Onsida.....E9	5	4725	4 1/2 x 5 1/2	36x6 40x12	W	Signal.....J	1 1/2	.....	4 1/2 x 5 1/2	34x4 36x8	W
Krebs.....140	5	.....	4 1/2 x 6	36x6 40x6d	W	Oshkosh.....A	2	2485	3 1/2 x 5	36x6n 36x6n	B	Signal.....M	3 1/2	.....	4 1/2 x 5 1/2	36x5 40x5d	W
						Oshkosh.....AA	2	2585	3 1/2 x 5	36x6n 36x6n	B	Signal.....R	5	.....	4 1/2 x 5 1/2	36x6 40x6d	W
						Oshkosh.....B	2 1/2	3485	4 x 5 1/2	38x7n 38x7n	B	*Standard.....75	1 1/2	1330	3 1/2 x 5	33x5n 33x5n	W
						Oshkosh.....BB	2 1/2	3585	4 x 5 1/2	38x7n 38x7n	B	Standard.....1-K	1	1600	3 1/2 x 5	34x3 1/2 34x5k	W
						*Overland.....4	1 1/2	425	3 1/2 x 4	30x3 1/2 30x3 1/2	B	Standard.....76	1 1/2	2100	4 1/2 x 5 1/2	36x4k 36x8	W
Larrabee.....X-2	1	1925	3 1/2 x 4 1/2	34x5n 34x5n	B							Standard.....66	1 1/2	3150	4 1/2 x 5 1/2	36x5 36x12	W
Larrabee.....U	1 1/2	2400	3 1/2 x 5	34x3 1/2 34x5	W							Standard.....5-K	5-7	4400	4 1/2 x 6	36x6 40x14	W
Larrabee.....J	1 1/2	2400	3 1/2 x 5	34x3 1/2 34x5k	W	Packard.....EC	2-3	3100	4 1/2 x 5 1/2	36x4 36x7	W	*Star.....1	1 1/2	610b	3 1/2 x 4 1/2	30x3 1/2 30x3 1/2	W
Larrabee.....K	2 1/2	3100	4 1/2 x 5 1/2	36x4 36x7	W	Packard.....EX	2-2 1/2	3100	4 1/2 x 5 1/2	36x6n 40x8n	W	Sterling.....1 1/2	1 1/2	2885	4 x 5 1/2	36x3 1/2 36x5k	W
Larrabee.....K-5	2 1/2	3450	4 1/2 x 5 1/2	36x4 36x8	W	Packard.....34-4	4100	4100	4 1/2 x 5 1/2	36x5 36x5d	W	Sterling.....2	2	3085	4 x 5 1/2	36x4k 36x6k	W
Larrabee.....L-4	3 1/2	4000	4 1/2 x 5 1/2	36x5 36x5d	W	Packard.....EF	5-7 1/2	4500	5 x 5 1/2	36x6 40x6d	W	Sterling.....2 1/2	2 1/2	3290	4 1/2 x 5 1/2	36x4k 36x4d	W
Larrabee.....W	5-7	4800	4 1/2 x 6	36x6 40x6d	W	Paige.....52-19	1 1/2	1950	4 x 5 1/2	34x3 1/2 34x5	W	Sterling.....3 1/2	3 1/2	4325	4 1/2 x 5 1/2	36x5k 40x5d	W
						Paige.....54-20	2 1/2	2420	4 1/2 x 5 1/2	34x4 34x8	W	Sterling.....5-W	5	4950	5 x 6 1/2	36x6 40x6d	W
Maccar.....L	1 1/2	.....	4 1/2 x 5 1/2	36x4 36x6	W	Paige.....51-18	3 1/2	3145	4 1/2 x 5 1/2	36x5 36x5d	W	Sterling.....5-C	5	5500	5 x 6 1/2	36x6 40x6d	C
Maccar.....H-A	2	.....	4 1/2 x 5 1/2	36x4 36x4d	W	Parker.....C-22	1	1875	3 1/2 x 5 1/2	34x5n 34x5n	W	Sterling.....7 1/2	7 1/2	6000	5 x 6 1/2	36x6 40x7d	C
Maccar.....H-2	3	.....	4 1/2 x 5 1/2	36x4 36x5d	W	Parker.....G-22	2 1/2	3200	4 1/2 x 5 1/2	34x4 36x4d	W	*Stewart.....Utility	4-11	1215	3 1/2 x 5 1/2	34x4 1/2 34x4 1/2	I
Maccar.....M-3	4	.....	4 1/2 x 5 1/2	36x5 36x6d	W	Parker.....J-20	3 1/2	3950	4 1/2 x 5 1/2	36x5 40x5d	W	Stewart.....1b	1b	1415	3 1/2 x 5 1/2	35x5n 35x5n	W
Maccar.....G	5-6	.....	4 1/2 x 5 1/2	36x5 40x6d	W	Parker.....M-20	5	4850	5 x 6	36x6 40x6d	W	Stewart.....9	9	1790	3 1/2 x 5	34x3 1/2 34x6	I
MacDonald.....A	7 1/2	5750	4 1/2 x 6	40x7 40x14	I	Patriot.....Revere	1	1380	3 1/2 x 5	35x5n 35x5n	W	Stewart.....7-X	7-X	2330	4 1/2 x 5 1/2	34x4 34x8	I
Mack.....AB D.R.	1 1/2	3450	4 x 5	36x4k 36x3 1/2 36x4d	D	Patriot.....Lincoln	2	2050	4 x 5 1/2	34x4 34x6	W	Stewart.....10-X	10-X	3190	4 1/2 x 5 1/2	36x5 36x10	I
Mack.....AB Chain	1 1/2	3000	4 x 5	36x4k 36x3 1/2 36x4d	D	Patriot.....LS-890	2	2175	4 x 5 1/2	34x4 34x6	W	*Stoughton.....C	3 1/2	1095	3 1/2 x 5	34x4 1/2 34x4 1/2	B
Mack.....AB D.R.	2	3300	4 1/2 x 5	36x4k 36x4d	C	Patriot.....Washt'n	3	2900	4 1/2 x 5 1/2	36x5 36x7	W	Stoughton.....A	1	1790	3 1/2 x 5 1/2	34x5n 34x5n	W
Mack.....AB D.R.	2 1/2	3750	4 1/2 x 5	36x4k 36x4d	C	Pierce-Arrow.....2	3200	3200	4 x 5 1/2	36x4 36x4d	W	Stoughton.....B	1 1/2	2150	3 1/2 x 5 1/2	36x3 1/2 36x5	W
Mack.....AC Chain	2 1/2	3850	4 1/2 x 5	36x4k 36x4d	D	Pierce-Arrow.....3 1/2	4350	4350	4 1/2 x 5 1/2	36x5 36x5d	W	Stoughton.....D	2	2490	4 x 5 1/2	36x4 36x7	W
Mack.....AC Chain	3 1/2	4100	4 1/2 x 5	36x4k 36x4d	C	Pierce-Arrow.....5	4850	4850	4 1/2 x 5 1/2	36x5 40x6d	W	Stoughton.....F	3	3150	4 1/2 x 5 1/2	36x5d 36x5d	W
Mack.....AC Chain	3 1/2	4950	5 x 6	36x5k 40x5d	C	Pittsburgher.....1 1/2-2	3000	3000	3 1/2 x 5	36x4 36x6	W	Sullivan.....E	2	2800	4 1/2 x 5 1/2	36x4k 36x7k	W
Mack.....AC Chain	5	5500	5 x 6	36x6 40x6d	C	Pittsburgher.....3	3800	3800	4 1/2 x 5 1/2	36x5k 36x7	W	Sullivan.....H	3 1/2	3750	4 1/2 x 6	36x5 36x5d	W
Mack.....AC Chain	6 1/2	5750	5 x 6	36x6 40x12	C	Power.....F	2	3150	4 x 5 1/2	36x5 36x7	W						
Mack.....AC Chain	7 1/2	6000	5 x 6	36x7 40x7d	C	Power.....C	3 1/2	.....	4 1/2 x 5 1/2	36x5 40x10	W						
Mack Trac.....AB	5	3400	4 1/2 x 5	36x4 36x4d	C	Premcar.....B-143	1 1/2	2475	3 1/2 x 5	36x6n 36x6n	W						
Mack Trac.....AC	10	5503	5 x 6	36x6 40x6d	C							*Thomart.....	1 1/2	1795	4 x 5 1/2	34x5 34x5	C
Mack Trac.....AC	13	5750	5 x 6	36x6 40x12	C							Tiffin.....GW	1 1/2	2100	4 1/2 x 5 1/2	36x3 1/2 36x5	W
Mack Trac.....AC	15	6000	5 x 6	36x7 40x7d	C							Tiffin.....MW	2 1/2	2700	4 1/2 x 5 1/2	36x4 36x3 1/2	W
*Mapleleaf.....A	1 1/2	3000	3 1/2 x 5 1/2	34x5n 36x6n	W	*Rainier.....R-21	3 1/2	.....	3 1/2 x 5	35x5n 35x5n	W	Tiffin.....PW	3 1/2	3600a	4 1/2 x 5 1/2	36x5 40x5d	W
Mapleleaf.....AA	2	3600	4 x 5 1/2	36x4 36x7	W	Rainier.....R-29	1	.....	3 1/2 x 5	34x3 1/2 34x4	W	Tiffin.....PW	5	4300	4 1/2 x 5 1/2	36x6 40x6d	W
Mapleleaf.....BB	3	4050	4 1/2 x 5 1/2	36x4 36x4d	W	Rainier.....R-26	1 1/2	.....	3 1/2 x 5	34x3 1/2 34x5	W	Titan.....	2	2750	4 x 5	36x4k 36x7k	D
Mapleleaf.....CC	4	4800	4 1/2 x 5 1/2	36x5 36x5d	W	Rainier.....R-28	2	.....	4 1/2 x 5 1/2	34x4 34x6	W	Titan.....	2 1/2	2700	4 1/2 x 5 1/2	36x4k 36x8k	D
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Rainier.....R-20	2 1/2-3	.....	4 1/2 x 5 1/2	34x4 34x7	W	Titan.....	3 1/2	3600	4 1/2 x 5 1/2	36x5k 40x10k	D
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Rainier.....R-15	3 1/2-5	.....	4 1/2 x 5 1/2	36x5 36x5d	W	Titan.....	5	4100	4 1/2 x 5 1/2	36x5 40x12	D
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Rainier.....R-25	3 1/2-5	.....	4 1/2 x 5 1/2	36x5 36x5d	W	Tower.....J	1 1/2	2000	4 1/2 x 5 1/2	35x5n 38x7n	W
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Rainier.....R-17	5-6	.....	4 1/2 x 5 1/2	36x6 40x6d	W	Tower.....H	2 1/2	2475	4 1/2 x 5 1/2	36x4 36x7	W
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Rainier.....R-27	6	.....	4 1/2 x 5 1/2	36x6 40x6d	W	Tower.....G	3 1/2	3475	4 1/2 x 5 1/2	36x5 36x5d	W
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Ranger.....TK-20-2	1 1/2	1450	3 1/2 x 5	36x6n 38x7n	W	Traffic.....	1 1/2	1595a	3 1/2 x 5	35x5n 35x5n	I
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	*Reo.....F	4-11	1185	4 1/2 x 5 1/2	34x4 1/2 34x4 1/2	B	Traffic.....C	2	1595a	3 1/2 x 5	34x3 1/2 34x5k	I
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Reliance.....10A	1 1/2	2400	4 x 5 1/2	36x3 1/2 36x5	I	Traffic.....C	3	1895a	3 1/2 x 5	36x4 36x7	I
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Reliance.....20B	2 1/2	3100	4 1/2 x 5 1/2	36x4 36x4d	I	Traffic.....C	3	1895a	3 1/2 x 5	36x4 36x7	I
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Republic.....75	3 1/2	1395b	4 1/2 x 5 1/2	32x4 1/2 32x4 1/2	I	Transport.....15	1	1295	3 1/2 x 5	32x4 1/2 32x4 1/2	B
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Republic.....10	1	1395	3 1/2 x 5	34x3 34x4	I	Transport.....25	1 1/2	1495	3 1/2 x 5 1/2	34x3 1/2 34x5k	I
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Republic.....10 Exp	1	1695	3 1/2 x 5	34x5n 34x5n	I	Transport.....35	2 1/2	1855a	3 1/2 x 5 1/2	36x3 1/2 36x6k	I
Mapleleaf.....DD	5	5625	4 1/2 x 5 1/2	36x6 40x6d	W	Republic.....11X	1 1/2	1795	3 1/2 x 5	34x4 34x6	I	Transport.....55	3	2335	4 1/2 x 5 1/2		



## Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front Rear	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front Rear	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front Rear	Final Drive
Veteran.....P**	2	\$3699	4 1/2 x 5 1/2	36x4 36x7	W	White.....40	3 1/2	\$4200	3 1/2 x 5 1/2	36x5 40x5d	D	Wichita.....O	4	\$3500	4 1/2 x 6 1/2	36x5k 36x5k	W
Veteran.....R**	3	4200	4 1/2 x 5 1/2	36x4 36x7	W	White.....45	5	4500	4 1/2 x 5 1/2	36x5 40x6d	D	Wilcox.....AA	1	1900	3 1/2 x 5 1/2	36x4k 36x4k	W
Veteran.....S**	4	5395	4 1/2 x 6	36x5 36x10	W	White Hick.....E	1	1225	3 1/2 x 5	34x5n 34x5n	W	Wilcox.....BB	1 1/2	2550	4 1/2 x 5	36x4 36x5	W
*Vim.....50	1 1/2-3 1/4	995	4 x 5	32x4n 32x4n	B	White Hick.....H	1 1/2	1375	3 1/2 x 5	36x3 1/2 36x5	W	Wilcox.....D	2 1/2	3000	4 1/2 x 5	36x4k 36x3 1/2 k	W
Walker-JohnsonA	2	2500	3 1/2 x 5	34x3 1/2 34x6	W	White Hick.....K	2 1/2	1875	4 1/2 x 5 1/2	36x4 36x5	W	Wilcox.....E	3 1/2	3950	4 1/2 x 6	36x5k 36x5k	W
Walker-JohnsonB	3	3000	4 1/2 x 5 1/2	36x4 36x8	W	Wichita.....K	1	1875	3 1/2 x 5 1/2	36x3 1/2 36x4k	W	Wilcox.....F	5	4350	4 1/2 x 6 1/2	36x5 40x6d	W
Walter.....M	2 1/2	3850	4 1/2 x 5 1/2	36x4 36x8	W	Wichita.....M	2	2400	3 1/2 x 5 1/2	36x3 1/2 36x6k	W	Wilson.....F	1 1/2	2270	3 1/2 x 5	36x3 1/2 36x5	W
Walter.....S	5	4850	4 1/2 x 6 1/2	36x6 40x6d	W	Wichita.....RX	3	3200	4 1/2 x 5 1/2	36x4k 36x8k	W	Wilson.....EA	2 1/2	2825	4 1/2 x 5 1/2	36x4 36x7	W
*Watson.....C	1	1465a	3 1/2 x 5 1/2	35x5n 35x5n	W							Wilson.....G	3 1/2	3685	4 1/2 x 5 1/2	36x5 36x5	W
Watson.....N	3 1/2	4250	4 1/2 x 5 1/2	36x5 36x10	W							Wilson.....H	5	4520	4 1/2 x 6	36x6 40x6	W
Western.....W1	1 1/2	2450	4 1/2 x 5 1/2	36x3 1/2 36x5k	W							*Wisconsin.....A	1	1750	3 1/2 x 5	34x5n 34x5n	W,B
Western.....L1	1 1/2	2450	3 1/2 x 5	36x3 1/2 36x5k	W							Wisconsin.....B	1 1/2	2100	3 1/2 x 5	35x5 36x6	W
Western.....W2	2 1/2	3250	4 1/2 x 5 1/2	36x4 36x7	W							Wisconsin.....C	2 1/2	2700	4 x 5 1/2	36x6n 36x7	W
Western.....L2	2 1/2	2450	4 1/2 x 6	36x4 36x7	W							Wisconsin.....D	3 1/2	3000	4 1/2 x 5 1/2	36x6n 40x8	W
Western.....W3	3 1/2	4000	4 1/2 x 6	36x5 40x5d	W							Wisconsin.....E	5	3500	4 1/2 x 6 1/2	36x6 36x10	W
*White.....15	3 1/2	2400	3 1/2 x 5 1/2	34x5n 34x5n	B							Wisconsin.....F	7	4000	5 x 6 1/2	36x6 36x12	W
White.....20	2	3250	3 1/2 x 5 1/2	36x4k 36x7k	D							Witt-Will.....N	1 1/2	2450	3 1/2 x 5	36x3 1/2 36x6k	W
												Witt-Will.....P	2 1/2	2900	4 1/2 x 5 1/2	36x4k 36x8k	W

FINAL DRIVE:—B—Bevel, C—Chain, D—Double Reduction, I—Internal Gear, W—Worm.

r—8 cyl. s—6 cyl. t—2 cyl.—all others are 4 cyl. d—dual tires. k—pneumatic tires optional at extra cost. n—pneumatic tires. a—price includes several items of equipment. b—price includes body. \*—express truck or delivery wagon. \*\*—Canadian Make. trac.—tractor.

## Specifications of Current Farm Tractor Models

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bore, Stroke	Fuel	Flow Capacity	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bore, Stroke	Fuel	Flow Capacity	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bore, Stroke	Fuel	Flow Capacity
Allis-Chal.G.P.	6-12	\$295	2	LeR.	4-3 1/2 x 4 1/2	Gas.	1	Gray.....	18-36	1975	3	Wauk.	4-4 1/2 x 6 1/2	Gas.	4	Oil Pull.....E	30-60	.....	4	Own	2-10x12	K,D	8-16
Allis-Chalm.....	15-25	1185	4	Midw.	4-4 1/2 x 5 1/2	Gas.	3									*Oldsmar.....K	2 1/2-5	\$225	4	Own	1-5 1/2 x 5 1/2	Gas.	1
Allis-Chalm.....	20-35	1885	4	Own	4-4 1/2 x 6 1/2	GorK	3-4	Hart-Parr.....20	20	.....	4	Own	2-5 1/2 x 6 1/2	K,D	2	Pioneer.....G	18-36	.....	4	Own	4-5 1/2 x 6	G,K,D	4
Allwork.....2-G	14-28	1595	4	Own	4-4 1/2 x 6 1/2	GorK	3	Hart-Parr.....30	30	.....	4	Own	2-6 1/2 x 7	K,D	3	Pioneer.....C	40-75	.....	4	Own	4-7 x 8	Gas.	10
Allwork.....C	14-28	1293	4	Own	4-5 x 6	GorK	3	Heider.....D	9-16	628	4	Wauk.	4-4 1/2 x 5 1/2	G,K	12								
*ARO.1921-22	3-6	385	4	Own	1-4 1/2 x 5	Gas.	1	Heider.....C	12-20	725	4	Wauk.	4-4 1/2 x 6 1/2	G,K	1	Russell.....	12-24	.....	4	Own	4-4 1/2 x 5 1/2	GorK	2-3
Aultman-T.....	15-30	.....	4	Clim.	4-5 x 6 1/2	G,K,D	4	Heider.....Cult	5-10	.....	4	LeR.	4-3 1/2 x 4 1/2	Gas.	3	Russell.....	15-30	.....	4	Own	4-5 1/2 x 6 1/2	GorK	3-4
Aultman-T.....	22-45	.....	4	Own	4-5 1/2 x 8	G,K,D	6	Huber Light 4	12-25	965	4	Wauk.	4-4 1/2 x 5 1/2	GorK	3	Russell.....	20-35	.....	4	Own	4-5 1/2 x 7	GorK	4-5
Aultman-T.....	30-60	.....	4	Own	4-7 x 9	G,K,D	8-10	Huber Super 4	15-30	.....	4	Midw.	4-4 1/2 x 6	Gas.	3	Russell.....	30-60	.....	4	Own	4-8 x 10	GorK	8-10
Avery,S.R.Cul.	5-10	.....	4	Own	4-3 x 4	G,K	1	International.....	8-16	.....	4	Own	4-4 1/2 x 5	G,K,D	2								
Avery Cult-C	.....	.....	3	Own	6-3 x 4	G,K	1	Internat.Titan	10-20	.....	4	Own	2-6 1/2 x 8	G,K,D	3	Shaw-Enechs (Grader)	.....	.....	2	LeRoi	4-3 1/2 x 4 1/2	Gas.	..
Avery.....C	.....	.....	4	Own	6-3 x 4	G,K	1	International.....	15-30	.....	4	Own	4-5 1/2 x 8	G,K,D	4								
*Avery.....	.....	.....	4	Own	4-4 1/2 x 5	G,K,D	3-4									ToroTractor22	6-10	675	3	LeR.	4-3 1/2 x 4 1/2	Gas.	2
Avery.....	12-25	.....	4	Own	2-6 1/2 x 7	G,K,D	2-3	La Crosse.....	6-12	.....	4	Own	2-4 x 6	G,K	1	Townsend.....	10-20	800	2	Own	4-6 1/2 x 7	Ker.	2-3
Avery.....	14-28	.....	4	Own	4-4 1/2 x 7	G,K,D	3-4	La Crosse.....	12-24	.....	2	Own	2-6 x 7	G,K	3	Townsend.....	15-30	1350	2	Own	4-7 x 8	Ker.	3-4
Avery.....	18-6	.....	4	Own	4-5 1/2 x 6	G,K,D	4-5	Lauson.....5	12-25	1285	4	Midw.	4-4 1/2 x 5 1/2	Gas.	3	Townsend.....	25-50	2500	2	Own	4-8 1/2 x 10	Ker.	4-8
Avery.....	25-50	.....	4	Own	4-6 1/2 x 7	G,K,D	5-6	Lauson.....21	15-30	1675	4	Beav.	4-4 1/2 x 6	GorK	3-4	Traylor.....TB	6-12	500	4	LeR.	4-3 1/2 x 4 1/2	GorK	1-2
Avery.....	45-65	.....	4	Own	4-7 1/2 x 8	G,K,D	8-10	Leader.....B	12-13	.....	4	Own	2-6 x 6 1/2	G,K,D	2-3	Twin City.....	12-20	.....	4	Own	4-4 1/2 x 6	H,K	3
								Leader.....N	16-32	.....	4	Clim.	4-5 x 6	G,K	3-4	Twin City.....	20-35	.....	4	Own	4-5 1/2 x 6 1/2	G,K	5-6
Bates All-StD	15-25	.....	4	Own	4-4 1/2 x 6	Gas.	3	Leader.....GU	18-35	.....	4	Clim.	4-6 x 6	G,K	3-4	Twin City.....	40-65	.....	4	Own	4-7 1/2 x 9	G,K	8-10
Bates Mule..H	15-25	.....	4	Midw.	4-4 1/2 x 5 1/2	Gas.	3	Lincoln.....	15-30	1600	2	Buda	4-4 1/2 x 6	G,K	3								
Bates Mule..F	18-25	.....	4	Midw.	4-4 1/2 x 6 1/2	Gas.	3	Little Giant..B	16-22	.....	4	Own	4-4 1/2 x 5	K	4	Uncle SamC20	12-20	1235	4	Weid.	4-4 x 5 1/2	G	2-3
BatesMule.G	25-35	.....	4	Midw.	4-4 1/2 x 6	Gas.	4	Little Giant..A	26-35	.....	4	Own	4-6 1/2 x 6	K	6	Uncle SamB19	20-30	1985	4	Beav.	4-4 1/2 x 6	GorK	3-4
Best.....	25-35	.....	4	Ste.	4-4 1/2 x 6 1/2	Gas.	4	Lombard.1922	100	.....	2	Wise.	6-5 1/2 x 7	Gas.	16	Uncle SamD21	20-30	1985	4	Beav.	4-4 1/2 x 6	GorK	3-4
*Beeman Jr..	1/2-1 1/2	180	2	B&S	1-3 1/2 x 2 1/2	Gas.	1									Utiliter.....501	2 1/2-4	295	4	Own	1-3 1/2 x 4 1/2	G	1
Best.....30	18-30	.....	4	Own	4-4 1/2 x 6 1/2	G,K,D	4									Utiliter.....501A	2 1/2-4	340	4	Own	1-3 1/2 x 4 1/2	G	1
Best.....60	35-55	.....	4	Own	4-6 1/2 x 8 1/2	G,K,D	8-9	MerryGar1922	2	210	2	Evin	1-2 1/2 x 2 1/2	Gas.	..								
*Bolens.....	15-30	2500	4	B&S	1-2 1/2 x 2 1/2	G,K	3	Minne...All-P	12-25	.....	4	Own	4-4 1/2 x 7	GorK	3	Wallis.....K	15-25	.....	4	Own	4-4 1/2 x 5 1/2	G,K	3
*Bryan.....	15-30	2500	4	Own	2-4 x 5	K.	3	Minne...Gen.P	17-30	.....	4	Own	4-4 1/2 x 7	GorK	3-4	Waterloo.....N	12-25	675	4	Own	2-6 1/2 x 7	Ker.	3
								Minne...Med.D	22-44	.....	4	Own	4-6 x 7	GorK	5-6	Wetmore21-22	12-25	1185	4	Wauk.	4-4 x 5 1/2	G,K	3
Case.....	12-20	1050	4	Own	4-4 1/2 x 5	G,K,D	2-3	MinneHeavyD	35-70	.....	4	Own	4-7 1/2 x 9	GorK	8-9	Wisconsin...E	16-30	1750	4	Clim.	4-5 x 6 1/2	GorK	3
Case.....	15-27	1320	4	Own	4-4 1/2 x 6	G,K,D	3-4	Moline Univ D	9-18	680	2	Own	4-3 1/2 x 5	Gas.	2-3	Wisconsin...H	22-40	2550	4	Clim.	4-5 1/2 x 7	GorK	4-6
Case.....	22-40	2550	4	Own	4-5 1/2 x 6 1/2	G,K,D	4-5	Moline Orch...	20-30	.....	2	Beav.	4-4 1/2 x 6	G,K,D	4								
Case.....	40-72	5200	4	Own	4-7 x 8	G,K,D	8-10									Yuba...15-25	15-25	2750	2	Wise.	4-4 1/2 x 6	G,K,D	..
Caterpillar T11	25	.....	4	Own	4-4 1/2 x 6	Gas.	4									Yuba...25-40	25-40	4250	2	Wise.	4-5 1/2 x 7	G,K,D	..
Caterpillar T16	40	.....	4	Own	4-6 1/2 x 7	Gas.	6																
Centaur.....F	5-2 1/2	345	2	N Way	2-2 1/2 x 5	GorK	1																
Cletrac.....F	9-16	.....	2	Own	4-3 1/2 x 4 1/2	G,K,D	2																
Cletrac.....W	12-20	.....	2	Own	4-4 x 5 1/2	G,K,D	2-3																
Do-It-All.....A	3-6	495	..	Own	1-4 1/2 x 5	Gas.	1																
Do-It-All, Jack	6	395	..	Own	1-3 1/2 x 3 1/2	Gas.	1																
Do-It-All.....6	12	495	2	Own	2-3 1/2 x 5 1/2	Gas.	1																
Eagle.....F	12-22	.....	4	Own	2-7 x 8	GorK	3-4																
Eagle.....H	16-30	.....	4	Own	2-8 x 8	GorK	4-5																
E-B.....AA	12-20	.....	4	Own	4-4 1/2 x 5	G,K,D	3																
E-B.....Q	12-20	.....	4	Own	4-4 1/2 x 5	G,K,D	3																
E-B.....	16-32	.....	4	Own	4-5 1/2 x 7	G,K,D	4																
Pageol.....D	9-18	.....	4	Lye.	4-3 1/2 x 5	Gas.	2																
Fordson.....	-18	395	4	Own	4-4 x 5	G,K	2	Oil Pull.....K	12-20	.....	4	Own	2-6 x 8	K,D	3								
Frick.....A	12-20	.....	4	Erd.	4-4 x 6	G,K	2-3	Oil Pull.....H	16-30	.....	4	Own	2-7 x 8 1/2	K,D	4								
Frick.....C	15-28	.....	4	Beav.	4-4 1/2 x 6	G,K	3-4	Oil Pull.....G	20-40	.....	4	Own	2-8 x 10	K,D	5-6								
ABBREVIATIONS: G—Gasoline. K—Kerosene. D—Distillate. Flow capacity varies in relation to operating conditions. Figures are based on 14 in. plows. Engine Make: Beav.—Beaver. B & S—Briggs & Stratton. Clim.—Climax. Cnt.—Continental. Dom.—Domas. Evin.—Evinrude. Lere.—Hercules. LeR.—LeRoy. Midw.—Midwest. Nway.—New Way. Nor.—Northway. Ste.—Stearns. Wauk.—Waukesha. Weid.—Weidely. Wis.—Wisconsin. *—Crawler type. All others are wheel type. †Price includes plows. ‡Trac.—Runner. Industrial Tractor. *Garden Tractor. **Steam Tractor.																							

## Specifications of Current Passenger Car Models

PRICES						Wheel Base	Tires	Engine Make	Cylinders: Bore and Stroke	Rated Horse Power (N.A.C.C.)	NAME AND MODEL	Carburetor	Starting and Lighting	Ignition	Clutch: Type and Make	Gearset	Universal: Type and Make	Rear Axle Type and Make	Gear Ratios
2-Pass.	5-Pass.	7-Pass.	Sport	Coupe	Sedan														
\$1995c	\$1785	\$1850	\$1885c		\$2485	127	33x4 1/2	H-S.	6-3 1/2x5	29.40	American D-66	Strom.	G-D.	A-K.	s-p B&B.	B & B.	m Hartford.	F Salis.	4.50
	1650				1450d	127	33x4	Own.	6-3 1/2x4 1/2	23.44	American Steamer	None.	L-N.	L-N.	None.	None.	m Durston.	f Salis.	1.75
	1195				1595d	114	32x4	Cont.	6-3 1/2x4 1/2	27.31	Anderson 41	Zenith.	West.	West.	s-p B&B.	Durston.	f Universal.	1/2 F Salis.	4.62
1495	1495	1595	1785b	1995c	1995d	120	33x4	Cont.	6-3 1/2x4 1/2	27.31	Anderson Series 50	Rayfield.	Remy.	Remy.	s-p B&B.	Durston.	f Universal.	3/4 F Salis.	4.62
	1535		1915c			114	32x4 1/2	Own.	6-3 1/2x4 1/2	23.44	Apperson 6	Strom.	Remy.	Remy.	s-p B&B.	None.	m Sterling.	1/2 F Own.	4.25
	2800	2900		3625	3800f	130	34x4 1/2	Own.	8-3 1/2x5	33.80	Apperson 8-21-S	Johnson.	Bijur.	Remy.	m-d Own.	Own.	m Sterling.	1/2 F Own.	4.25
					3750d														
	1275	1345	1895c	1965f	2245	121	32x4	Cont.	6-3 1/2x4 1/2	27.34	Auburn 6-51	Strom.	Remy.	Remy.	s-p B&B.	G-L.	m Universal.	F Salis.	4.75
	1095			1025a	1465	114	31x4	Cont.	6-3 1/2x4 1/2	23.44	Auburn 6-43	Strom.	Remy.	Remy.	s-p B&B.	Warner	m	1/2 F Col.	
						112	32x4 1/2	Cont.	6-3 1/2x5	25.35	Auburn 6-63	Strom.	Remy.	Remy.	s-p B&B.	Warner	m	1/2 F Col.	
	1395			1495d	1850d	114	32x4	Cont.	6-3 1/2x4 1/2	23.44	Barley 1923-34-5-6-7-33	Strom.	Delco	Delco.	s-p B&B.	Fueller.	f M&E.	1/2 F Col.	4.58
865	885	725g		1175	1395	109	31x4	Own.	4-3 3/4x4 1/2	18.23	Buick 1923-34-5-6-7-33	Marvel.	Delco.	Delco.	m-d Own.	Own.	m Own.	1/2 F Own.	4.66
				1325															
1175	1195	975g		1935	1985	118	33x4 1/2	Own.	6-3 1/2x4 1/2	27.31	Buick 1923-41-4-5-47	Marvel.	Delco.	Delco.	m-d Own.	Own.	m Own.	F Own.	4.40
	1435	1625a		1895	2195	124	33x4 1/2	Own.	6-3 1/2x4 1/2	27.31	Buick 1923 48-9-50-4-55	Marvel.	Delap.	Delco.	m-d Own.	Own.	m Own.	F Own.	4.40
				1675c															
2885	2885	2885		3675	3950	132	33x5	Own.	8-3 1/2x5 1/2	31.25	Cadillac 61	Own.	Delco.	Deico.	m-d Own.	Own.	m Spicer.	F Tim.	Opt.
				3750d	4300														
1750b	1790		2230d	2480	2575	122	32x4 1/2	Cont.	6-3 1/2x4 1/2	27.31	Case X	Rayfield.	Delco.	Delco.	m-d Own.	Own.	f Sneed.	1/2 F Col.	4.66
			1990	1950c	2975b	129	34x4 1/2	Cont.	6-3 1/2x5 1/2	31.54	Case W	Rayfield.	Delco.	Delco.	m-d Own.	Own.	f Arvac.	1/2 F Col.	4.45
1185	1185			1595	2295	117	32x4	Own.	6-3 1/2x4 1/2	25.35	Chalmers 1923	Strom.	A-L.	Remy.	m-d Own.	Own.	m Hardy.	1/2 F Adams	5.13
					1685	122	32x4	Own.	6-3 1/2x4 1/2	25.35	Chalmers 1923	Strom.	A-L.	Remy.	m-d Own.	Own.	m Hardy.	1/2 F Adams	5.13
1595c	1395c	1545	1595a	1955d	1695d	123	33x4	Own.	6-3 1/2x5	29.40	Chandler Six	Rayfield.	Bosch.	Bosch.	s-p B&B.	Own.	f Own.	F Own.	4.45
	1695c			2195d	2295f														
510	525	425g		840c	860	103	30x3 1/2	Own.	4-3 1/2x4	21.76	Chevrolet Superior	Zenith.	Holley	Remy.	e Own.	Own.	m Own.	1/2 F Own.	3.77
				880c															
710	725	625g		1040c	1060	103	30x3 1/2	Own.	4-3 1/2x3 1/2	19.60	Chevrolet M	Carter.	Remy.	Remy.	m-d Own.	Own.	m Mech.	1/2 F Own.	4.44
				880k															
1085b	995		1260d	1485d	112 1/2	31x4	Own.	6-3 1/2x4 1/2	22.50	Cleveland 42	Strom.	Bosch.	Bosch.	s-p B&B.	Own.	m Mech.	1/2 F Own.	4.90	
1885		1885		2585b	2685f	127 1/2	33x5	North.	8-3 1/2x5 1/2	39.20	Cole 890	Johnson.	Delco.	Delco.	m-d North.	Own.	m Spicer.	1/2 F Col.	4.70
				2635d															
	1475			1995c	1905d	115	32x4	Cont.	6-3 1/2x4 1/2	27.34	Columbia Big Six	Strom.	A-L.	A-K.	s-p B&B.	Durston.	m Spicer.	1/2 F Tim.	4.75
995	985		1395d	1235a	1395d	115	31x4	Cont.	6-3 1/2x4 1/2	23.44	Columbia Light Six	Strom.	A-L.	A-L.	s-p B&B.	Durston.	m Spicer.	1/2 F Tim.	4.80
	1095																		
1195	1235		1495b	2055d	2055d	116	32x4	Falls.	6-3 1/2x4 1/2	23.44	Courier	Strom.	West.	A-K.	s-p B&B.	Muncie.	f Flexite.	3/4 F Col.	5.00
			1565c	1875f															
		3000		4500	138	33x4 1/2	Cont.	6-3 1/2x5 1/2	31.54	Crawford 23-6-60	Zenith.	West.	Bosch.	m-d B-L.	B-L.	m Spicer.	1/2 F Tim.		
				4250c	138	33x4 1/2	Cont.	6-3 1/2x5 1/2	31.54	Crawford-Dagmar 6-70	Zenith.	West.	Bosch.	m-d B-L.	B-L.	m Spicer.	1/2 F Tim.		
					142	33x5	Own.	8-3 1/2x5	45.00	Cunningham V	Strom.	Delco.	Delco.	m-d Own.	Own.	f Sneed.	F Tim.	4.23	
4350c	4350e	4350	435 c	5350c	6000	132	33x5	Own.	8-3 1/2x5 1/2	39.20	Daniels 23-38	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	F Tim.	4.23
1495b	1295		1495c	1795c	1795d	115	31x4	Cont.	6-3 1/2x4 1/2	23.44	Davis 71	Strom.	Delco.	Delco.	s-p B&B.	Warner.	m Peters.	1/2 F Tim.	5.10
1595	1595		1695	2095	120	32x4	Cont.	6-3 1/2x4 1/2	27.34	Davis 63-65	Strom.	Delco.	Delco.	s-p B&B.	Warner.	m Peters.	1/2 F Tim.	5.15	
850	880		980b	1440d	114	32x4	Own.	4-3 1/2x4 1/2	24.03	Dodge Brothers	Stewart.	N.E.	N.E.	m-d Own.	Own.	m Own.	1/2 F Own.	4.16	
				1195b															
	3950c	3950	4150c	4985c	5750f	132	33x5	Own.	6-4 x5	38.40	Dorris 6-80	Strom.	West.	Bosch.	m-d Own.	Warner.	m Spicer.	1/2 F Tim.	4.23
865	865		1015a	1240	1370	108	31x4	D-Ly.	4-3 1/2x5	19.60	Dort 19-14	Carter.	Bosch.	Conn.	m-d Detlaff.	Own.	m Mech.	1/2 F Flint.	4.66
			1015d	1020k	1070k														
990	990			1145	1195	115	31x4	Falls.	6-3 1/2x4 1/2	23.44	Dort 25-20	Carter.	Bosch.	Bosch.	m-d Detlaff.	Own.	m Mech.	1/2 F Flint.	4.66
				1365	1495														
6500				7800c	7800b	134	33x5	Own.	8-2 1/2x5	26.45	Duesenberg Straight 8	Strom.	Delco.	Delco.	s-p Own.	Own.	f Climax.	1/2 F Own.	4.45
890	890		1095c	1365	1365	109	31x4	Cont.	4-3 1/2x4 1/2	24.03	Durant A-22	Till.	A-L.	A-L.	s-p Own.	Warner.	m Spicer.	1/2 F Adams	4.33
				1465f															
1600	1650		2250	2400	123 1/2	32x4 1/2	Anst.	6-3 1/2x4 1/2	25.35	Durant B-22	Rayfield.	A-L.	A-L.	s-p Ansted.	Warner.	m Spicer.	1/2 F Tim.	5.15	
1485	1095		1795c	1795d	112	32x4	Own.	4-3 1/2x4	18.91	Earl 40	Scot.	A-L.	Conn.	s-p B&B.	Own.	f Own.	1/2 F Own.	4.87	
	965		1165d	1425d	112	31x4	Lye.	4-1 1/2x5	19.60	Elcar 4-40	Strom.	Delco.	Delco.	s-p B&B.	Muncie.	m Peters.	1/2 F Salis.	4.50	
1395	1395		1975	2065	118	33x4	Cont.	6-3 1/2x4 1/2	25.35	Elcar 6-60	Strom.	Delco.	Delco.	m-d Warner.	Warner.	m Spicer.	1/2 F Salis.	4.50	
	1045		1145	1245k	108 1/2	32x4	Own.	4-3 1/2x5	18.23	Essex	Own.	Bosch.	Bosch.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.66	
	1195c		1895c	1985d	120	32x4 1/2	Cont.	6-3 1/2x4 1/2	27.34	Flint	Strom.	A-L.	A-L.	s-p B&B.	Warner.	m Spicer.	1/2 F Adams.		
269r	298a	235g		530	595	100	30x3 1/2	Own.	4-3 1/2x4	22.50	Ford T	Own.	Own.	Own.	m-d Own.	Own.	m Own.	1/2 F Own.	3.63
				725															
3900	2975		4900	4900d	132	32x4 1/2	Own.	6-3 1/2x5	27.34	Fox 7F	Zenith.	West.	Scintilla.	m-d B-L.	B-L.	m Spicer.	1/2 F Tim.	4.90	
1900	1950		2750c	2850d	115	32x4	Own.	4-3 1/2x4	25.35	Franklin 10	Own.	N.E.	A-K.	s-p B&B.	Own.	m Spicer.	1/2 F Tim.	4.73	
965	965		1065c	1115k	1365d	112	32x4	Lye.	4-3 1/2x5	21.76	Gardner T-R & G	Carter.	West.	West.	s-p B&B.	Mech.	m Mech.	1/2 F Flint.	4.80
490	490		685b	785d	100	30x3 1/2	Own.	4-3 1/2x4	21.03	Gray	Scot.	West.	West.	m-d Own.	Own.	m Mech.	1/2 F Tim.	3.90	
				835d															
2250	2250c		2600	2850d	120	32x4 1/2	Weid.	4-3 1/2x5 1/2	22.50	H.C.S. Series 4	Strom.	Delco.	Delco.	m-d B-L.	B-L.	m Spicer.	1/2 F Own.		
	2650				116	32x4 1/2	Midw.	6-3 1/2x5	29.40	H. C. S. Series 6	Strom.	Delco.	Delco.	m-d B-L.	B-L.	m Spicer.	1/2 F Own.		
1350			1350d	1425d	115	32x4 1/2	Falls.	6-3 1/2x4 1/2	23.44	Handley 6-40	Strom.	Bosch.	Bosch.	m-d Mech.	Mech.	m	Tim.		
		2150		125	32x4 1/2	Midw.	6-3 1/2x5	27.34	Handley 6-60					m-d	m		1/2 F Tim.	4.90	
1595	1595	1695c	2475c	2585d	121	32x4	Cont.	6-3 1/2x4 1/2	27.31	Hanson 66	Marvel.	Delco.	Delco.	s-p B&B.	G-L.	m Universal.	F Tim.	4.66	
	1345	1345c		1950	1950	115	32 x 4	H-S.	4-3 1/2x5	19.60	Hatfield A-42	Zenith.	Dynety.	Conn.	s-p B&B.	G-L.	m Spicer.	3/4 F Col.	4.66
	1775	1795	1975d	2175	2275	121	32x4	H-S.	4-3 1/2x5	25									

## MISCELLANEOUS

a-2 Passenger, d-5 Passenger,  
b-3 Passenger, e-6 Passenger,  
c-4 Passenger, f-7 Passenger,  
g-Chassis Price,  
h-All Metal Type,  
k-Soft Top Type,  
n-Tire Size 32x4 1/2,  
p-Sport,  
r-Price without starter and demountable rims. Price, complete, \$364.  
e-Price without starter and demountable rims. Price, complete, \$393.  
†Standard Phaetons.  
‡-Brougham

## ENGINE

Anst-Ansted  
Cont-Continental  
D-Ly-Dort Lycoming  
H-S-Herschell-Spillman  
Lye-Lycoming  
North-Northway  
Walk-Walker  
Weid-Weidely

## CARBURETOR

Ball & B-Ball & Ball  
Till-Tillotson  
Strom-Stromberg  
Y & T-Yale & Towne

## CLUTCH

c-Cone  
m-d-Multiple disc  
s-p-Single plate  
R & B-Borg & Beck  
B-L-Brown-Lipe  
North-Northway

## STARTING, LIGHTING

IGNITION  
A-L-Auto Lite  
G-D-Gray & Davis  
L-N-Leece Neville  
N. E.-North East  
West-Westinghouse

## GEARSET

B-L-Brown-Lipe  
G-L-Grant-Loss  
Mech-Mechanics  
North-Northway

## UNIVERSAL

f-fabric  
m-metal  
M & E-Merchant & Evans  
Mech-Mechanics

## REAR AXLE



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## Specifications of Current Passenger Car Models

PRICES						Wheel Base	Tires	Engine Make	Cylinders: Bore and Stroke	Rated Horse Power (N.A.C.C.)	NAME AND MODEL	Carburetor	Starting and Lighting	Ignition	Clutch: Type and Make	Gearset	Universal: Type and Make	Rear Axle: Type and Make	Gear Ratios	
2-Pass.	5-Pass.	7-Pass.	Sport	Coupe	Sedan															
3185a 3435c 885	3435c 3185c 885	\$3185	\$3385a	\$3985	4385f 4385c 1235 1335 1635f	136	32x4 1/2	Own.	6-3 1/2 x 5 1/2	33.75	Marmion.....34	Strom.	Delco	Delco	m-d Own	Own.	m Spicer	3/4 F Own	3.75	
				985	1235 1335 1635f	109	31x4	Own.	4-3 1/2 x 4 1/2	21.03	Maxwell.....	Stewart.	Remy	Remy	e Own	Own.	f Own	1/2 F Own	4.60	
5400	4550g	5700	5000e		6720 6720c 9000f 6810f	140	33x5	Own.	6-4 1/2 x 6	48.60	McFarlan.....1923	Rayfield.	West.	West.	m-d M&E	B-L	m Peters	F Tim.	3.75	
3950b 3750c	3950c 3750c	3950e	3750c		4850 5250e 5000e 5000e	132	32x4 1/2	Own.	4-3 1/2 x 6 1/2	22.50	Mercer.....Series 5	Ball&B.	West.	Eisemann.	m-d Own	Own.	m Spicer	F Own	3.87	
				4700f		132	32x4 1/2	Own.	6-3 1/2 x 5	33.75	Mercer.....6	Strom.		Eisemann.	m-d Own.	Own.	m Spicer	3/4 F Own	3.77	
1895	1895				2275d	119	32x4	Cont.	6-3 1/2 x 4 1/2	25.35	Merit.....	Strom.	Delco	Delco	s-p B&B.	Muncie.	f Sneed.	F Col.	4.60	
1490b	1590		1850e	2050e	2275d	120	32x4	Own.	6-3 1/2 x 5	29.40	Mitchell.....F-50	Strom.	Remy	Remy	s-p B&B.	Own.	m Own.	F Own	4.42	
		1690			127	127	32x4 1/2	Own.	6-3 1/2 x 5	29.40	Mitchell.....F-50	Strom.	Remy	Remy	s-p B&B.	Own.	m Own.	F Own	4.42	
	1295		1445d	1585e	1695f	115	31x4	Cont.	6-3 1/2 x 4 1/2	23.44	Moon.....6-40	Strom.	Delco	Delco	s-p B&B.	Warner.	m Spicer	1/2 F Tim.	4.80	
			1785	1995	2585e	2485f	128	33x4 1/2	Cont.	6-3 1/2 x 4 1/2	27.34	Moon.....6-58	Strom.	Delco	Delco	s-p B&B.	B-L	m Spicer	1/2 F Tim.	5.09
					2685f															
1210	1240		1645e		2040d	121	33x4	Own.	6-3 1/2 x 5	25.35	Nash.....691-3-6-7	Marvel.	Delco	Delco	s-p B&B.	Own.	m Own.	1/2 F Own	4.50	
		1390			2190f	127	34x4 1/2	Own.	6-3 1/2 x 5	25.35	Nash.....692-4-5	Marvel.	Delco	Delco	s-p B&B.	Own.	m Own.	1/2 F Own	4.50	
915	935				1385b 1195k 1275k	112	33x4	Own.	4-3 1/2 x 5	18.23	Nash.....41-4	Schebler.	Delco	Delco	s-p B&B.	Own.	m Own.	1/2 F Own	4.88	
2475b	2475e	2375	2485d	3250e	3285f	130	32x4 1/2	Own.	6-3 1/2 x 5 1/2	29.40	National.....6-71	Rayfield.	West.	Delco	s-p B&B.	B-L	m Universal	F Col.	4.08	
	1485				1785d	121	32x4	Cont.	6-3 1/2 x 4 1/2	27.34	National.....6-51	Stromb.	A-L	Own.	s-p B&B.	Covert.	m Universal	3/4 F Salis	4.50	
	795				1095d	112		Own.	6		National.....6-31									
2590	2500	2600c			3500d	128	32x4 1/2	Cont.	6-3 1/2 x 4 1/2	27.33	Noma.....4C	Zenith.	Delco	Delco	s-p B&B.	Detroit.	m Spicer	1/2 F Tim.	4.45	
975	995	795g	1165e	1445d	1545	115	32x4	Own.	6-2 1/2 x 4 1/2	18.99	Oakland.....6-44	Marvel.	Remy	Remy	e Own.	Muncie.	m Mech.	F Own	4.33	
1145p					1185a 1195a															
955	975	1350d	1075	1475	1595	115	32x4	Own.	4-3 1/2 x 5 1/2	21.86	Oldsmobile.....43 A	Zenith.	Delco	Remy	s-p B&B.	Muncie	m Own.	3/4 F Own	4.70	
	1850e	1735			2635f	122	33x4 1/2	Own.	8-2 1/2 x 4 1/2	26.45	Oldsmobile.....46	Ball&B.	Delco	Delco	e Own.	Muncie	m Spicer	F Own	4.93	
1625	1375		1675e	1875b	2025d	115	32x4	Own.	8-2 1/2 x 4 1/2	26.45	Oldsmobile.....47	Johnson.	Delco	Delco	s-p B&B.	Muncie	m Own.	3/4 F Own	5.10	
525	525		425g	795	860d	100	30x3 1/2	Own.	4-3 1/2 x 4	18.23	Overland.....91	Till.	A-L	Conn.	s-p B&B.	Own.	m Own.	1/2 F Own	4.50	
2485	2485	2250g	2650c	3175e	3275d	126	33x4 1/2	Own.	6-3 1/2 x 5	27.34	Packard.....126	Own.	A-K	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.30	
					3325d															
	2350g	2685			3525f	133	33x4 1/2	Own.	6-3 1/2 x 5	27.34	Packard.....133	Own.	A-K	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.66	
					3575f															
3850	3850c	3850		5240e	5400f	136	35x5	Own.	12-3x 5	43.20	Packard.....335	Own.	Bijur	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.36	
					5275f															
2695b	2450c	2450		3135	3235d	131	33x4 1/2	Cont.	6-3 1/2 x 5	33.75	Paige.....6-70	Rayfield.	Remy	A-K	m-d Long.	Warner.	m Mech.	1/2 F Tim.	4.45	
					3235f															
	1390	1425		2295	2395	120	32x4 1/2	Cont.	6-3 1/2 x 4 1/2	27.34	Paterson.....22-6-52	Strom.	Delco	Delco	s-p B&B.	Durston.	m Hartford	1/2 F Std.	4.50	
3300	2990c	2990		3300a	3390d	128	33x5	Own.	8-3 1/2 x 5	33.80	Pearless.....23	Ball&B.	Delco	Delco	m-d Own.	Own.	m Spicer	3/4 F Tim.	4.90	
				3100e	409 f															
5250	5250c	5250		6800	6900e	138	33x5	Own.	6-4 x 5 1/2	38.40	Pierce-Arrow.....	Own.	Delco	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.29	
					7000f															
2050	2000	2050		2950	3000	126	32x4 1/2	H-S.	6-3 1/2 x 5	25.35	Pilot.....6-50	Till.	Bijur	Conn.	s-p B&B.	Muncie.	m Hartford	3/4 F Col.	1.33	
575	595			895	995	102	32x3 1/2		4-3 1/2 x 4 1/2	14.40	Premier.....Strattan	Zenith	A-L	A-L	Covert.	Covert.				
3150	3100c	3250		4300	5100	126 1/2	32x4 1/2	Own.	6-3 1/2 x 5 1/2	27.34	Premier.....6-D	Johnson.	Delco	Delco	s-p B-B	Own.	m Spicer	3/4 F	4.58	
1095	1095			1750	1825	117	32x4	Falls.	6-3 1/2 x 4 1/2	23.44	Premcor.....6-40-A	Strom.	Wagner	Wagner	s-p B&B.	Mech.	m Spicer	1/2 F	4.66	
2485b	2585p	2485		3350	3550f	128	32x4 1/2	Anst.	6-3 1/2 x 5 1/2	27.34	Princeton.....	Rayfield.	A-L	A-L	m-d Durant.		m Spicer	1/2 F Dur.	5.12	
					3675f	132	32x4 1/2	Anst.	6-3 1/2 x 5 1/2	27.34	Princeton.....	Rayfield.	A-L	A-L	m-d Durant.		m Spicer	1/2 F Dur.	5.12	
	1665			2385e	2475d	116	32x4	Own.	4-3 1/2 x 5	22.50	R & V Knight.....R	Strom.	Wagner	Wagner	s-p B&B.	B-L	m Spicer	F Salis	4.75	
	2850	2900			3500d	124	32x4 1/2	Own.	6-3 1/2 x 4 1/2	29.40	R & V Knight.....H	Strom.	Wagner	Wagner	s-p B&B.	B-L	m Spicer	1/2 F Tim.	5.40	
					3700f															
	1645	1485	1745	1835c	1885d	120	32x4	Own.	6-3 1/2 x 5	24.34	Reo.....T6	Rayfield.	N.E.	N.E.	m-d Own.	Own.	m f Own.	1/2 F Own.	4.70	
				2185f																
	1485			1885c	1985d	117	32x4	Own.	6-3 1/2 x 4 1/2	23.44	Rickenbacker.....A	Strom.	Simms	A-K	s-p Own.	Warner.	m Universal	3/4 F Col.	4.63	
2685	2485e	2685	2750e	3585	3585d	128	32x4 1/2	Cont.	6-3 1/2 x 5 1/2	29.40	Roamer.....6-54-E	Strom.	West	Splitdorf	s-p B&B.	G-L	f Sneed.	1/2 F Tim.	4.60	
3685	3485e	3800	3650c	4650e	4650e	128	32x4 1/2	Roch.	4-4 1/2 x 6	28.90	Roamer.....4-75-E	Strom.	West	Splitdorf	m-d B-L	B-L	f Sneed.	1/2 F Own.	4.08	
3785																				
10900	10900	10950			13150	143 1/2	35x5	Own.	6-4 1/2 x 4 1/2	48.60	Rolls-Royce.....40-50	Own.	Bijur	Bosch	e Own.	Own.	m Own.	F Own.	3.25	
					12900															
					5100c	118	32x4	Own.	4-2 1/2 x 5 1/2	12.10	Rubay.....	Stromb.	Bosch	Bosch	s-p Own.	Own.	m Universal	F Own.	5.10	
					5250e															
1645	1645			2645	2645	118	33x4	Cont.	6-3 1/2 x 4 1/2	27.34	Sayers Six.....DP	Strom.	Delco	Delco	s-p B&B.	G-L	m Arvac	1/2 F Std.	4.75	
875	875				108	30x3 1/2	Lyc.	4-3 1/2 x 5	19.60	Seneca.....L-2 & O-2	Zenith.	A-L	A-L	s-p B&B.	G-L	m Universal	F Peru	4.75		
985	985				112	31x4	Lyc.	4-3 1/2 x 5	19.60	Seneca.....50 & 51	Zenith.	A-L	A-L	s-p B&B.	G-L	m Universal	F Peru	4.50		
2150		2395	2395	2750	3200	127	34x4 1/2	Own.	8-3 1/2 x 5	33.80	Standard.....740	Zenith.	West.	Splitdorf	s-p B&B.	G-L	m Arvac	1/2 F Tim.	4.45	
2750	2750	2750	2425g	3905c	3585d	130	32x4 1/2	Own.	2-4 x 5		Stanley.....98	None	Bijur	None	None	None	None	1/2 F Own.	1.50	
					3985f															
319	348a	285g		580	645	102	30x3 1/2	Cont.	4-3 1/2 x 4 1/2	15.63	Star.....	Till.	A-L	A-L	s-p Own.	Warner.	Spicer	3/4 F Tim.	4.87	
2250	2250	2450	2275e	3150e	3450f	125	34x4 1/2	Own.	4-3 1/2 x 5 1/2	22.50	Stearns-Knight.....SKL4	Rayfield.	West.	A-K	m-d Own.	Own.	f Climax	1/2 F Own.	1.50	
2700	2700																			



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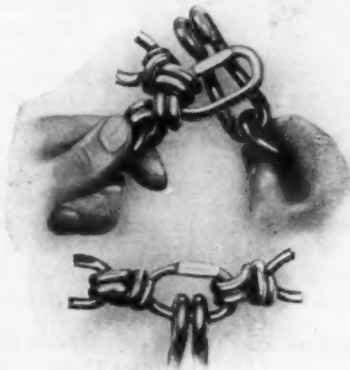
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"Automotive Equipment Manufacturers for Almost a Quarter Century."  
PITTSFIELD, MASSACHUSETTS U. S. A.

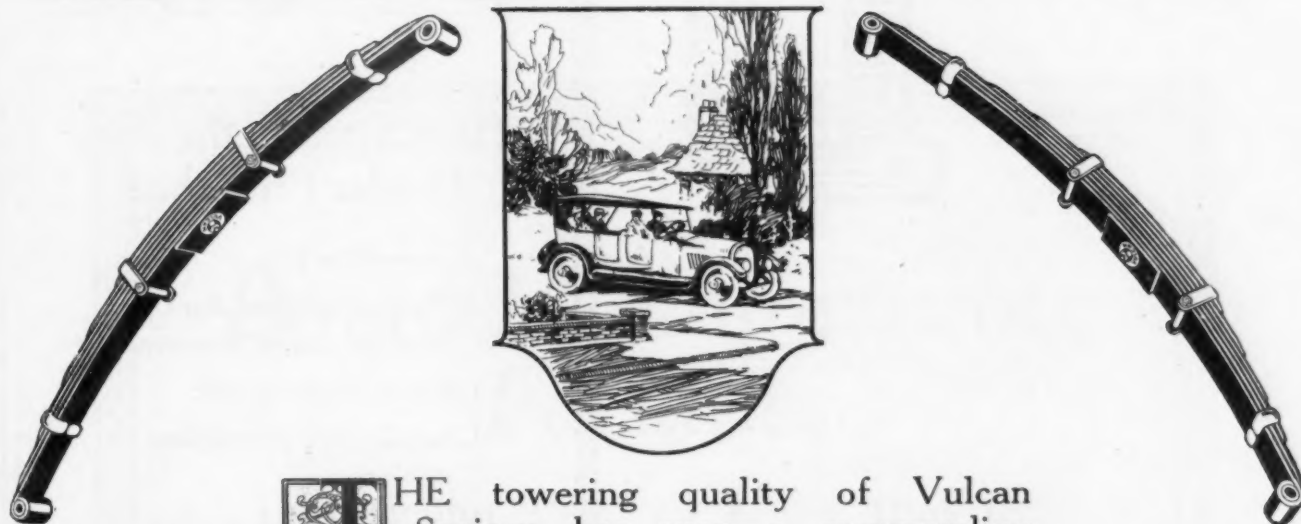




# VULCAN

QUALITY

## THE SPRING SUPREME



**T**HE towering quality of Vulcan Springs has won a commanding place in the automobile industry.

The name Vulcan has come to be associated instantly with the best in riding comfort, and spring service. That the car riding public does discriminate in the matter of buying replacement springs is evidenced by our ever widening distribution, which now makes it possible to offer Vulcan Springs

**"In Every Town for Every Car"**

If you are not now handling Vulcan Springs, ask your jobber about the better sales policy and greater profits available to Vulcan dealers.

**Jenkins Vulcan Spring Co.**

RICHMOND, INDIANA

BOSTON DALLAS ST. LOUIS SAN FRANCISCO SEATTLE PORTLAND

# SPRINGS

This Name Plate



on Every Spring

# THE DORT

## *High Spots of the Dort Dealer Franchise*

A complete line.

A franchise that does not require yearly renewal.

Liberal dealer profit.

Liberal price protection to dealers.

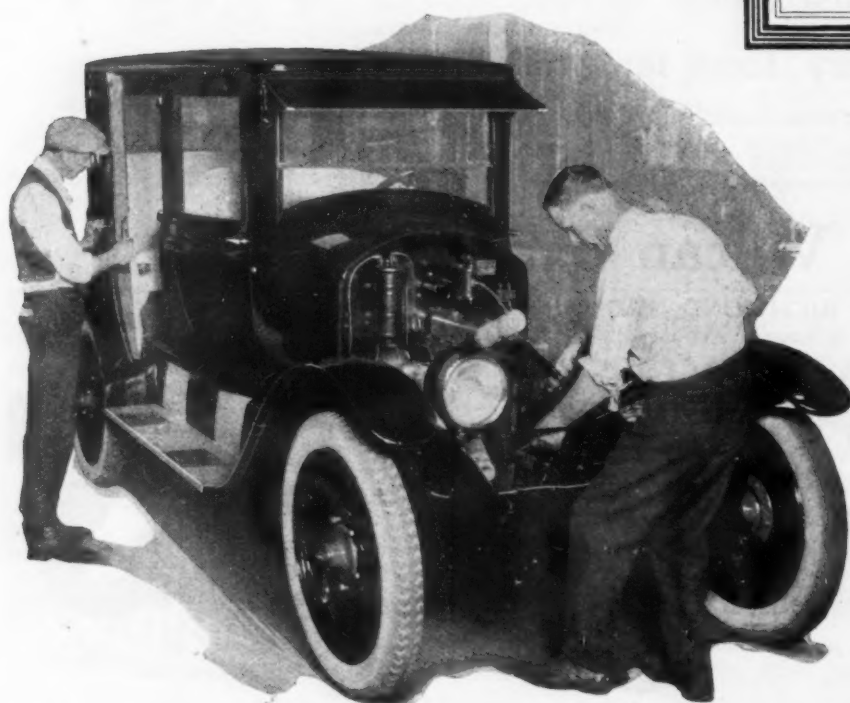
High value and quality of product.

Broad market.

Established reputation.

Manufacturing facilities of the Company.

Extensive advertising.



*The great precision and care exercised in the building of each Dort Car assures the owner years of trouble-free performance.*



# DEALER FRANCHISE

*Embracing a Complete Line of Sixes and Fours*

## *Broad Manufacturing Facilities*

The dealer likes to know that the manufacturing concern with which he does business has ample working capital and complete facilities for building a modern quality car. The Dort Motor Car Company has both.

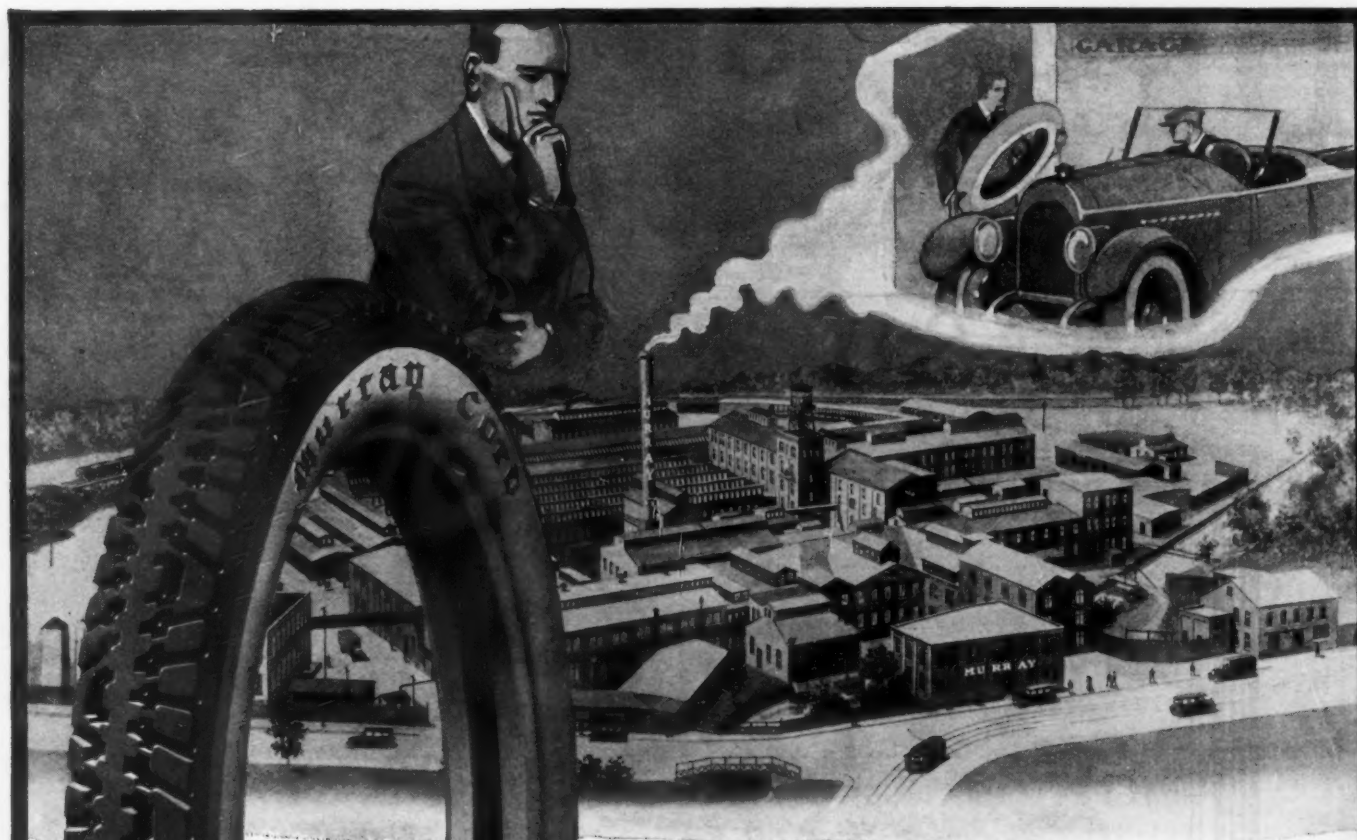
With a large factory in Flint and a body plant in Kalamazoo, Dort cars can be said to be almost wholly Dort made.

Indeed, Dort's extensive manufacturing facilities is one of the prime reasons why Dort is able to build such a high quality car at such a low price.

DORT MOTOR CAR COMPANY  
Flint, Michigan

QUALITY GOES CLEAR THROUGH

(1482)



## SUPPOSE YOU WERE BUILDING —AND DISTRIBUTING—A TIRE

You'd see that none of your profits were wiped out  
by needless waste and expense.

**Murray**  
"Neer A Worry" TIRES

are the application, for the first time, of these principles to the tire building industry. The dealer's own tire. We've studied the situation carefully and eliminated every expense that formerly drew heavily on the profits that legitimately belong to the dealer—and us. As the result we have been able to build a better tire—a super-standard tire—and sell it to the dealer at a price enabling him to meet any competition and make an unusually large profit.

EXTRA  
PROFITS

NO  
EXPENSIVE  
BRANCHES

TAX AND  
FREIGHT  
PAID

NO OLD  
COMMITMENTS  
FOR HIGH PRICED  
MATERIAL

NO  
BURDENSOME  
OVERHEAD

SOLD DIRECT  
FROM THE  
FACTORY TO YOU

SATISFIED  
CUSTOMERS

RESTRICTED  
AGENCIES

### EVERY MURRAY TIRE A SOU'-EASTER

Made and tested for the South-East wheel, where the traffic is roughest. The reinforcement on the side wall gives "truck-tire" strength where the strain is hardest.

**MURRAY**  
**RUBBER COMPANY**  
TRENTON, N. J.

### WRITE DEPT. M A 2 FOR OUR EXCLUSIVE DEALERS' PROPOSITION

Be the sole distributor in your community for this quality, profit-bearing tire. We will be glad to discuss our distribution plan with dealers and show how we can make such a good tire at such a low price.



# Garage Men—Increase Your Pay!

## Trained Auto Electricians Make BIG Money



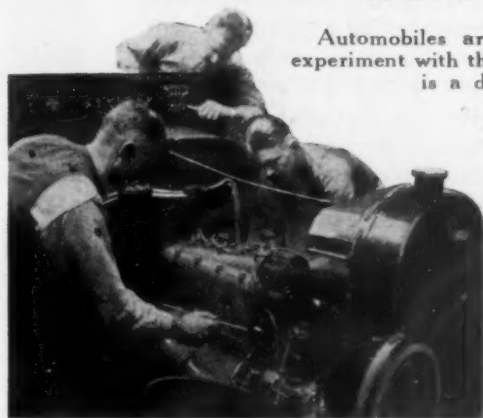
Many a good auto mechanic is getting only a mechanic's pay because he is weak on Automotive Electrics. Fully 75% of car troubles come from this source, yet but one auto mechanic in ten is an auto electrical expert. That's why thousands of BIG PAY JOBS are open to a Trained Auto Electrician.

Everywhere experts are wanted who can tell what is wrong with electrical systems of cars, trucks and tractors. Big money is paid the man who can make the repairs properly and quickly. That's why you should investigate the Michigan State Automobile School's **Advanced Automotive Electrical Course**.

### What We Teach—and Why

Automobiles are too expensive to let an untrained man experiment with them. The electrical system of an automobile is a delicate mechanism. It must be thoroughly understood to successfully solve the many problems connected with automobile construction and operation.

Our **Advanced Electrical Course** covers this subject completely, both as regards theory and practice. When you have finished the course, you will be thoroughly trained in the handling of the electrical problems of autos, trucks, tractors, gas engines and farm lighting plants. That's why M. S. A. S. Electrical Graduates get big pay and are always in demand. They are thoroughly trained—they **KNOW!**



### A Few Weeks' Training Will Double Your Salary

A few weeks here teaches you everything electrical about the automobile. You have actual practice in testing, wiring, and adjusting every part of starting, lighting and ignition systems, overhauling old systems, tearing down and assembling, operating them on live motors, trouble shooting on live cars, building and repairing of storage batteries, armature winding, etc. This course is advanced work and will enable experienced mechanics to do better work at double or treble the salary of the average mechanic.

### Michigan State Automobile School

7601 Auto Bldg.,

Detroit, Mich.

### Big Auto Factories Endorse Our School

The letters from factory representatives reproduced on this page speak for themselves. The M. S. A. S. is the only Factory Endorsed School. Many of the manufacturers helped outline our courses because they appreciated what we were doing. They know that our Graduates are Trained Men. Do you realize the value of this co-operative spirit? Of course you do! Then fill in and mail the coupon at the right. It brings our complete catalog and special information about the **Advanced Electrical Course**. **USE IT NOW.**

### Endorsed by Big Factories Read These Letters



DETROIT, MICH., U. S. A.

Do not believe you would make any mistake in attending this school if you wish to become thoroughly experienced in the automobile business.

**HUDSON MOTOR CAR COMPANY**  
DETROIT, MICH., U. S. A.

This school is thought very highly of by the automobile men of Detroit. You will make no mistake by entering for a course.



**BUICK MOTOR COMPANY**

We believe the Michigan State Auto School located at Detroit would best meet your requirements, as its course in technical training is most thorough and complete in every detail.

**THE STUDEBAKER CORPORATION**  
OF AMERICA

We do not know a better automobile school that we could recommend to you than the Michigan State.

### Learn in Detroit— It's a Big Advantage

When you think of automobiles you think of Detroit, the Auto Center, and it is only natural to think of the M. S. A. S. in the Auto Center when you think of Automobile Training. This is the Heart of Auto Industry—the Automobile Center of the World. Practically 79 per cent of the automobiles are made in the Detroit district. This is a big advantage for M. S. A. S. students. They get the benefit of hearty co-operation from the big factories. They meet factory executives and service men; they learn manufacturing methods first handed; they listen to lectures and talks by factory men; they learn about automotive subjects in a manner impossible away from the factories. That is why M. S. A. S. trained men are in demand with big factories and service stations.

### Mail Coupon Today

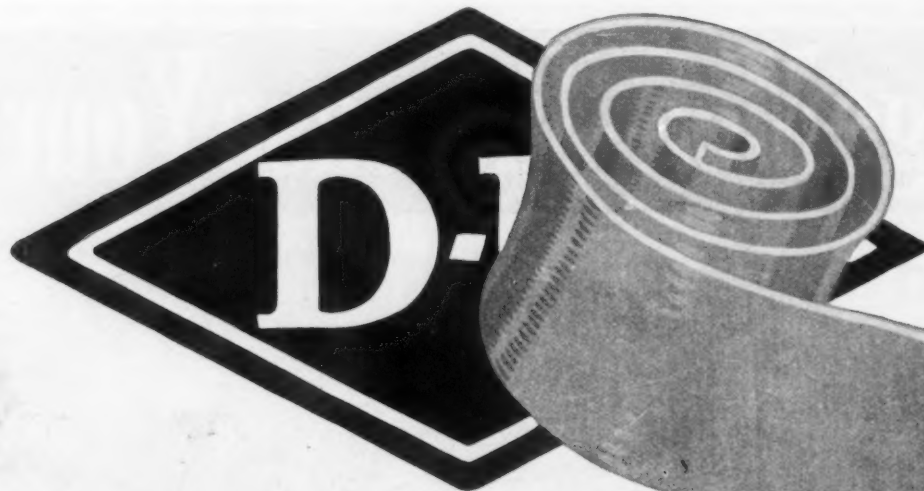
Michigan State Automobile School  
7601 Auto Bldg. 3729 Woodward Ave.  
Detroit, Michigan

Gentlemen: Please send me your big illustrated catalog and special information on the **Advanced Electrical Course**.

Name .....

Street or R. F. D. ....

City....., State.....



## A new source of real profit!

**T**ESTS prove that Double-D Tire Flaps *Increase tube Mileage an average of Over One-Third.* The motoring public is just beginning to realize this fact, but dealers are feeling it every day in greater demand for Double-D Flaps.

The time is ripe for you to start pushing Double-D Flaps. They will bring you splendid profit with little or no selling effort. More than that, Double-D Flaps through increased tire mileage satisfy customers—customers who come back.

### *Sell the best*

**T**HE best flap on the market is the flap you should sell. That is Double-D. Its quality begins in the raw material. It is manufactured in the largest exclusive flap making plant in the world. Its long life and economy are assured by constant, exhaustive tests and by daily use on hundreds of thousands of motor cars.

### *Low selling cost*

**I**T takes neither time nor effort to sell Double-D Tire Flaps. A simple statement

to your customers at the time you are fixing his tire that a new flap means greatly increased mileage will result in a sale. The superlative quality of Double-D Flaps is apparent at a glance.

### *Don't lose out!*

**T**HE first dealer in your locality who features tire flaps is going to make new friends and permanent customers. The last dealer who features them is going to have a lot of lost ground to make up. Don't be that man! Double-D sales repeat time after time for satisfied users everywhere confirm the one-third-greater mileage record made in tests.

Greater volume and greater unit profit both result when Double-D Tire Flaps are carried and displayed. The market all around you will surpass your most enthusiastic estimate; and you cannot afford to overlook this market!

We will gladly give you the sales records of dealers similarly located. If you are interested in this new and profitable business, use the coupon. Dexter Rubber Manufacturing Company, Goshen, New York.

# DOUBLE-D

TIRE  FLAPS

## Increase tire mileage

Send this today to

DEXTER RUBBER MANUFACTURING COMPANY  
Goshen, New York

Please send me your price list and sample of Dexter Tire Flap.

Name .....

Address .....







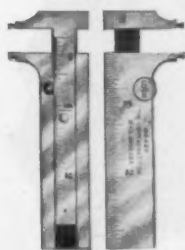
STARRETT MICROMETER CALIPER No. 226 (from 1 to 6 inches by thousandths). For fitting crank-bearings, piston pins, etc.—testing circularity of con-rod, crank-pins, etc.



STARRETT INSIDE MICROMETER CALIPERS No. 120 (Set A—2" to 8", Set B—2" to 12", Set C—8" to 32", Set D—2" to 32"). Can be used with auxiliary handle. Gauging bores of cylinders and any inside diameter.



STARRETT THICKNESS GAGE No. 71. Spacing spark plug gaps—adjusting breaker points on timer—valve tappets, determining thickness of shims, etc.



STARRETT POCKET SLIDE CALIPERS No. 425. For quick, accurate inside and outside measurements. A handy little tool that every mechanic should carry with him at all times.



## You can't get along without precision tools these days

Micrometers—Gages—Calipers—you **MUST** have them if you're going to turn out the accurate fits demanded in first class repair work today.

Starrett Tools—the finest precision tools made—enable you to quickly and accurately check your work to the thousandth part of an inch. Starrett Tools are known all over the world for their accuracy—you'll find them handy and convenient to use and built for a lifetime's hard service.

Why use rule of thumb methods and **GUESS** at your work. It's easy to **KNOW**. Use Starrett Tools—and notice the difference.

### THE L. S. STARRETT CO.

*The World's Greatest Toolmakers*  
*Manufacturers of Hackaws Unexcelled*  
ATHOL, MASS.

Other Starrett Tools for the auto-mechanic are completely described in the Starrett Catalog No. 22-RB and Supplement (with the latest tool additions). Write for them today.

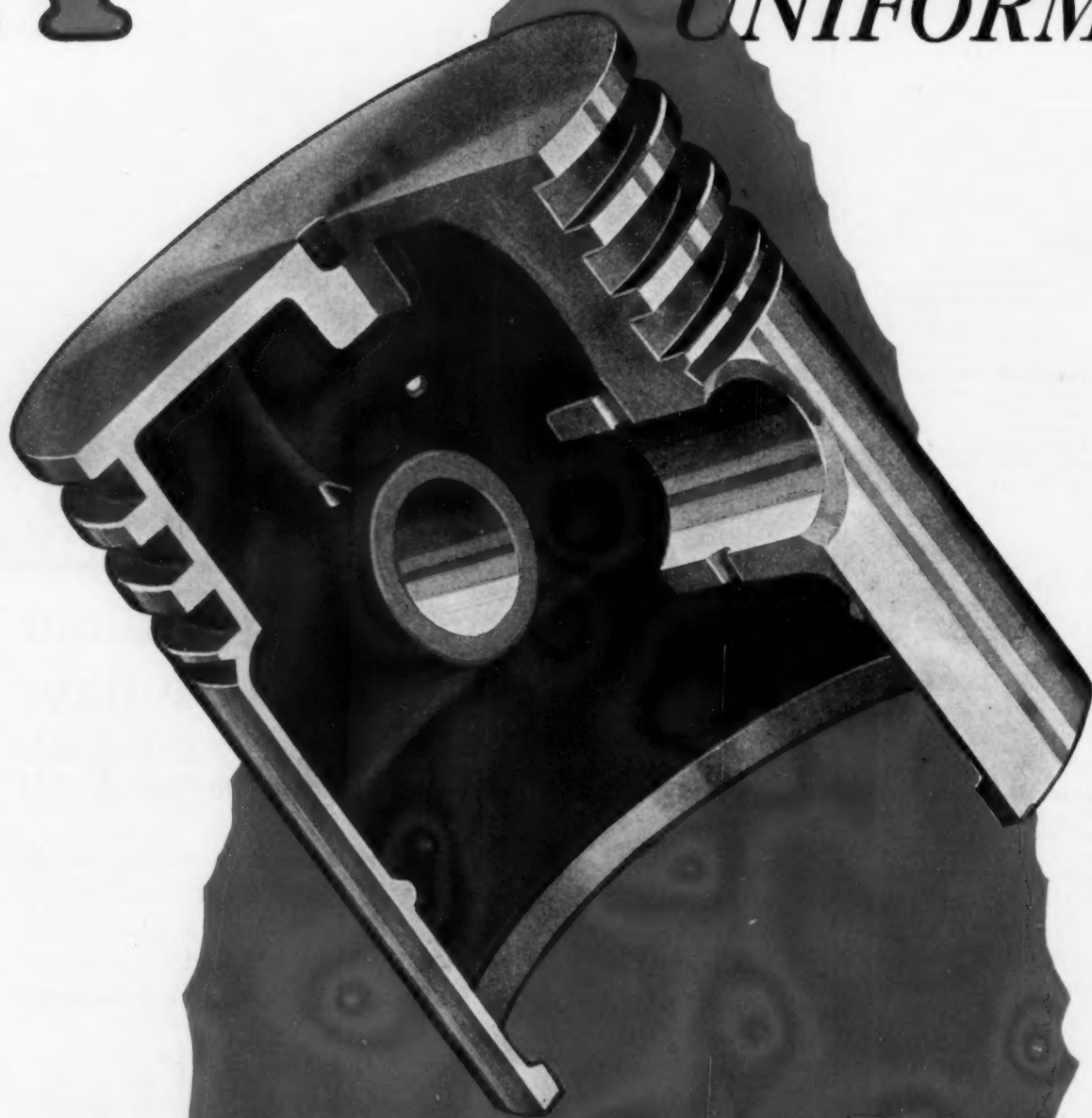
4804



# Use Starrett Tools

# Arrow Head

## UNIFORM



The wall thickness in Arrow Head grey iron Pistons does not vary. The pin holes always line up and are square with the wall. Heat treated for 24 hours in furnaces specially built for us. Each type of piston has its individual jigs and fixtures.

*The "Arrow Head" is Your Guarantee*



# Products

## DEPENDABLE

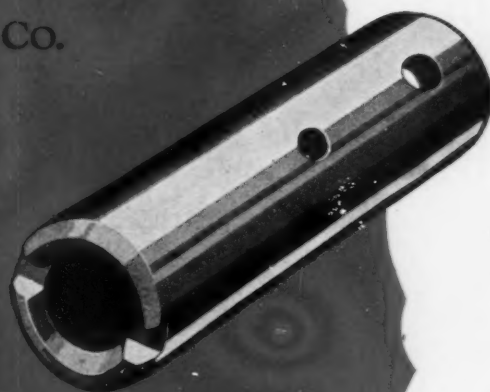


You can always depend on Arrow Head Pistons, Piston Pins and Axle and Drive Shafts to be perfect in material and workmanship.

They are made on specially designed machinery in the largest plant in the world for the exclusive manufacture of these products.

ARROW HEAD STEEL PRODUCTS CO.  
MINNEAPOLIS, MINNESOTA

General Sales Offices,  
616 S. Michigan Ave.,  
Chicago, Ill.



***Let "Arrow Head" be Your Business Builder***



The eyes of the industry have been on the Peerless during the past year.

The strides it has already made are a forecast of what is to come.

The Peerless management considers that the interest of the distributor and the dealer is its own first interest.

It is committed to do all in its power to help its distributors and dealers to make a satisfactory profit from the outset, and to increase that profit as the business grows, year by year.

Its contract is an advantageous one.

Its policies are eminently fair and sound.

In territories and localities where Peerless is not now represented, plain business sagacity dictates the wisdom of an inquiry to the factory Sales Department.

THE PEERLESS MOTOR CAR COMPANY  
CLEVELAND, OHIO

P E E R L E S S



*Every dealer, motorist  
garage and service man  
should have a copy  
of this free book. →  
Send for yours  
today*



*Announcing  
the*

## **BULLARD Dry Gas** **PROCESS OF CARBURETION**

**D**EVELOPED and made practical by a long established, nationally known engineering and manufacturing organization.

A process that—for the first time in automotive history—delivers to the cylinders of the engine a perfectly dry, *unified*, mixture-charge.

A process that uses less fuel, obtains *complete* gasification and

combustion, eliminates fuel carbon, prevents dilution of crank-case oil, increases power, and adds vastly to the general economy and efficiency of the modern automobile.

The instrument which, alone, gives you the benefits of this entirely new process is small, compact, can be installed on any car in a short time, and at a moderate cost.

**The Bullard Machine Tool Co., Inc.**

(AUTOMOTIVE DIVISION)  
BRIDGEPORT, CONNECTICUT



(Makers of the Bullard Multiple Dry-Disc Clutch, Bullard Bumpers, and the Bullard Shock-Absorber)

# Hot Spots for

**Snappy Cap**  
Bethlehem

The Snappy Cap for Fords. Press the trigger, cap flies open. Give the radiator its drink, and click-it-closed. Just like that! The demand was so great that we have brought out a Snappy Cap for Dodge and Chevrolet and similar models. There is now a Snappy Cap for every car that rolls on rubber.



## De Luxe Cap

Here's a new line of Snappy Caps (de luxe model) for the higher-priced cars. No WONDER they sell. They not only have that million-dollar look but they make filling the radiator a matter of seconds. The de luxe cap is thief-proof, too.

Put a razor-edge on the dull months! Don't wait for spring business to take the hollow out of the old sales-curves. Tie up with the bell-ringing line of Bethlehem Betterments, and January and February sales will prove that buying "seasons" are the bunk.

Bethlehem Betterments are MORE than auto accessories—they're auto necessities! People don't lay up their PURSES for the winter any more than they do their cars. They're just as ready to buy auto NECESSITIES in January as in June. Hot spots for cold engines—that's Bethlehem all over!



The big illustration to the left shows the new C-Special Bethlehem Quickway wrench-set—"a whole tool-kit in itself." Made for the motorist who does his own tinkering, and useful 365 days in the year. Has a ratchet handle, an L-handle, short bar for close clearances, and eight sockets that take care of most of the nuts on any car. You know the "A," "B" and "C" sets. This is C-Special. Exactly what car-owners want.

**bethlehem betterments**



# Cold Sales Engines

Here's Bethlehem spark plug No. 8 (Ford part No. 5200) — the plug that "busted the spark-plug situation wide open." This boy shoots a "mean" spark deep into the firing-chamber every time.



Not "hit or miss"—but HIT!—Five millions of them wringing every ounce of energy out of the motor-fuel. Bethlehem Spark Plugs are standard equipment on Packard, Studebaker Light Six, etc. A ready, steady seller all year round.

You'll get "cashiers' cramp" cranking up the old N. C. R., and there's more truth than humor in that: The turnover on Bethlehem Betterments is as steady as the turnover on the old water-wheel, and a lot more profitable. With the new line of radiator-caps and the two new Quickway wrench-sets, to say nothing of the old reliables, you've sure got ammunition for sales right through the year.

Prices? You know Bethlehem! Our volume business in 1922 was due to quality goods, priced below what the trade thought possible. That's the policy we have laid out for 1923. Just let me give you some confidential information that will make your eyes pop! Write me—today. Shall we send samples?

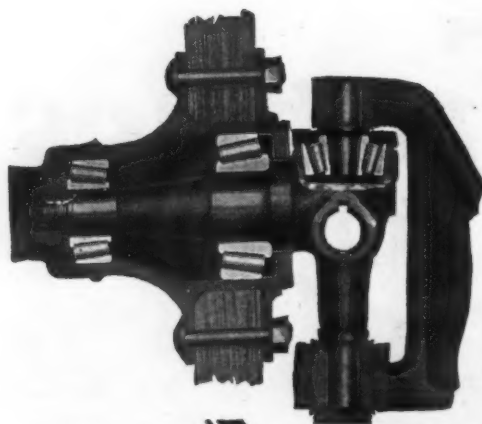
*H. Schwalb*  
President

BETHLEHEM SPARK PLUG CO., INC.  
BETHLEHEM, PA.

Here's the Mechanics' "D" set—the very last syllable in tool-kits. Takes smallest generator-nut up to largest nut on any car. Has a ratchet handle, an L-handle, a T-handle, three short lengths for cramped quarters, also a universal knuckle—and 23 sockets! A kit for mechanic and motorist alike. AND PRICED RIGHT!



# for Motordom



## Eliminating High Ratios In Steering Gears

In trying to meet the nation-wide demand for easy (nice) steering, manufacturers have been confronted with the problem of sacrificing *quick* control for easy turning.

By increasing the ratio of the steering gear, it is possible to decrease the amount of strength necessary to turn the wheel.

*But* the time interval between the driver's perception, and his ability to change the course of the vehicle, is increased because of the greater motion required at the steering wheel.

A logical, safe method to accomplish easy (nice) steering comes with Timken Tapered Roller Bearings in the steering pivots.

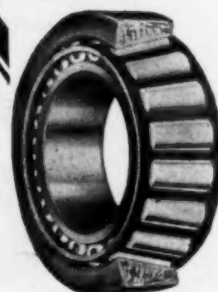
Not only do Timken Bearings make steering easier, but they permit the cutting down of steering gear ratios to as low as 6 to 1—thus bringing about easier steering without sacrificing quick control.

Most automobiles noted for their nice steering *and* quick control have Timken Tapered Roller Bearings in the steering pivots.

The Timken Roller Bearing Co  
CANTON, OHIO

Buyers Are Demanding  
Easy Steering—and They're Right

**TIMKEN**  
*Tapered*  
**ROLLER BEARINGS**





# Over 4 Million

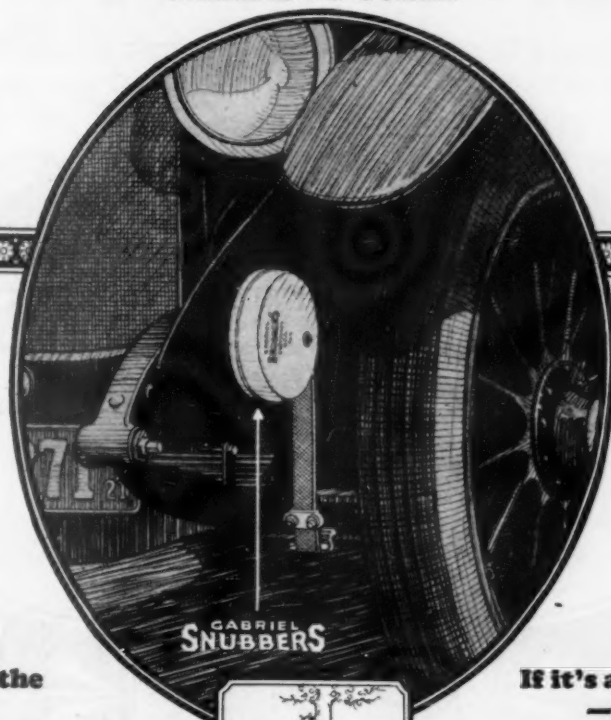
Gabriel Snubbers in use. There is no other Snubber.

*Sold by legitimate dealers*

GABRIEL MANUFACTURING COMPANY  
1415 East 40th Street Cleveland, Ohio

## GABRIEL SNUBBERS

THERE IS NO OTHER



Keep You on the  
Seat  
Save Your Car



If it's a Snubber  
—it's a  
"GABRIEL"

## What kind of advertising will increase your sales most?

### *How one Hanes distributor found the most effective method*

WHEN it comes down to dollars and cents in tire sales there seems to be no doubt that local newspaper advertising over your own name brings in the largest returns. Consider the results obtained by a Hanes Cord Tire distributor in Lexington, Kentucky, a district with a car registration of 4,671.

The third of June, 1922 this Hanes distributor received his first shipment. That morning the first ad of the regular 7,800 line series (given every Hanes distributor, large or small) was released in the Lexington Herald. At the close of Wednesday, November 29, 1922 this Hanes distributor had disposed of exactly \$7,520.44 worth of Hanes Cords. This represents an average purchase by every car owner of \$1.61 worth of Hanes

Cords in a period of 4 months and 26 days. It is a typical Hanes sales record.

Just to be sure that you, too, can do such a business the Hanes Rubber Company will run a similar 7,800 line campaign in your local newspaper—the initial ad to be released the day you receive your first shipment of Hanes Cords. Estimate the number of cars registered in your town or city and multiply by \$1.61 and you will find out for yourself just what business is easily possible for you to do.

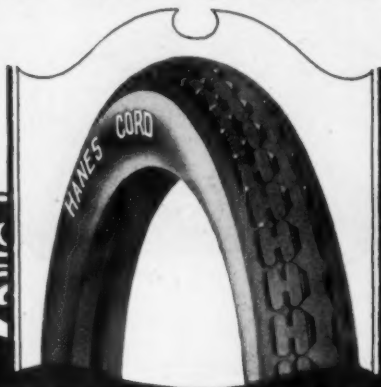
If yours is a town of having say 14,000 cars, stop now and consider whether or not you would like to do \$22,540 worth of tire business in the next six months. If you do we shall be glad to send a Hanes representative to talk with you.

HANES RUBBER COMPANY,

Winston-Salem, North Carolina

## HANES CORD TIRES

*The High Water Mark in Tire-making Skill*







## The Dealer Who Sells a Car Powered With One of the New Lycoming Motors Has a Tremendous Sales Advantage

### *The Purpose of the Red Head*

The Red Head on all new Lycoming "Fours" is used irrespective of size or specifications. Therefore when seen in either passenger cars or trucks, it may be on any of four different models, solely for the purpose of indicating them as motors made by Lycoming.

**F**IRST, he starts off backed by nearly 200,000 car owners who have already expressed preference for LYCOMING MOTORS by using them.

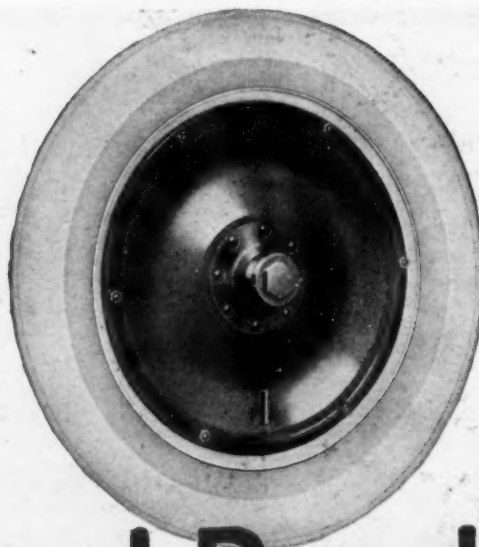
Then when he lifts the hood, instant attention of the prospective buyer is drawn to the *Red Head* and the first glance identifies it as one of the remarkable new LYCOMING MOTORS, with which countless prospects are being familiarized by one of the most thoroughly merchandised national advertising campaigns ever put back of a motor.

Part of this campaign includes a book for the car owner, "The Business of Buying a Car," brim full of interesting facts and figures that should make every dealer want to read it through from cover to cover. A copy will be sent to you on request.

*Are you reading the Lycoming pages in The Saturday Evening Post? The next one appears February 3rd*

LYCOMING MOTORS CORPORATION, WILLIAMSPORT, PENNSYLVANIA

*The New* **LYCOMING** *Motors*



# Motor Wheel Products



Spinning discs of color enliven hurrying streets —from day to day more cars a-roll on Tuarc steel wheels.

Sixteen manufacturers now produce cars enhanced by Tuarc. Appearance alone, however, accounts for no such wide preferment by factory engineers.

With Tuarc steel wheels they are able to provide the quite indispensable convenience of standard demountable rims, for easiest tire changing and for light weight of spares. With Tuarc no extra hubs, no special tire carrier, and no assembly complications enter in.

Tuarc have always permitted use of universal outside tire valves, a Motor Wheel development so potent as to change the whole trend of steel wheel design.

A steel wheel so far advanced, mirrors all the years of Motor Wheel experience with wheels of every type.

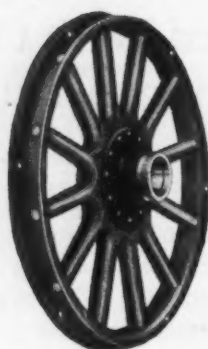
4,000,000 wood wheels for passenger cars and trucks is the annual capacity of Motor Wheel. This huge production necessitates a corresponding expanse of sawmills, dry kilns and assembling plants, and acreages of standing hickory, under Motor Wheel control.

Even metal parts for wood wheels made by Motor Wheel come from its noted Gier pressed steel plant.

It is the Gier plant too, which has originated and produced for the industry so many metal stampings to improve automobiles; as do all Motor Wheel Products.

**MOTOR WHEEL CORPORATION**  
Lansing, Michigan

**Tuarc**  
STEEL WHEELS







# GATES HOSE

*"The Standardized Radiator Hose"*



Marked by Inches  
Easily Cut to Length

235,000 feet of Gates Vulco Hose made and shipped this month — only 20 months since it was first introduced. Pretty good evidence that quality pays.

Made by the World's Largest  
Manufacturers of Fan Belts.



# Here's the Display Board that Asks 'Em To Buy

**A** FLASH of color you simply can't resist looking at. Mounts 50 Ford Red Top Plugs.

This sales compelling Display Board is free to you with an order for 100 plugs—and you'll sell 'em.

Your customer just naturally reaches for a plug—"Say, Jim—what's this plug, a new one?"

This gives you your chance to tell 'em and that's your chance to sell 'em.

We believe it's the best value—best

looking—best selling plug you've ever seen.

The complete line of 6 sizes takes care of every car on the market. Spit Fire is priced lower to you than any other standard plug.

Without delay—today—get in touch with us. Order your 100 and your board now.

MOSLER  
METAL PRODUCTS CORP.  
MT. VERNON, N. Y.

Ford Size  
60c

All other sizes  
\$1.00

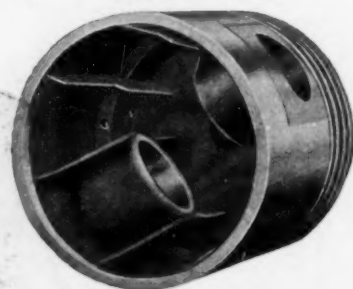


**"Spit Fire"—a name as old as the industry**



## Every driver is eager to go!

It is here where you want the energy, the responsiveness that puts the jump in your engine and keeps it there when the copper flashes—GO! It's the car with the go stuff in it that gets there first. It's the car that's got the motor with the light reciprocating parts and there's a reason—it is because heavy reciprocating parts absorb much of the energy your gas is yielding that should be applied to the tractive effort. That is why motors equipped with



**FOSTER**

### Sensible Lightweight Gray Iron Pistons

have the snap, the get-away that gets the jump on the guy who is utilizing so much of the effort from the gas to keep the excessive weight of ordinary factory pistons going at high speed.

**FOSTER** Pistons are 30% to 40% lighter than the ordinary factory pistons and they give you 7% to 10% more power.



*Adjusts Like a  
Micrometer*

#### THE FJ PISTON REAMER

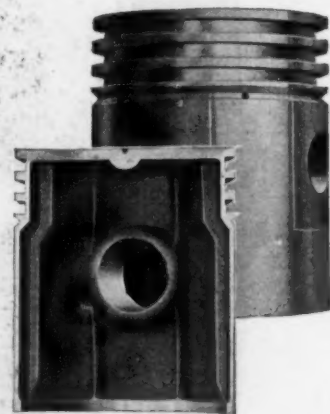
You have heard a lot about reamers, but how many of them that you know about will do the work as quickly and surely as the F-J.

How many of them expand and contract the blades with just one adjusting screw like a micrometer? How many will ream both holes at the same time? How many of them will be their near equal?

Our reamer catalog tells all about them. Write for it.

Ask the user of **FOSTER** Pistons, then judge them by the results they have given; don't go by unproved claims.

**Let's go and see them. Where?** At your nearest jobber, but if you are too busy just now, let us send you a sample half piston and our large catalog.



#### MR. JOBBER AND SERVICE MAN

For the betterment of your business nothing can excel a line of **FOSTER** Pistons. Their design and manufacture are based upon sensible ideas, chosen for the work demanded and we have the variety for you.

Our proposition is more than liberal. We will be glad to tender our service to you. Write us.

**FOSTER-JOHNSON REAMER CO.**

1050 Beardsley Ave.

ELKHART, IND.



# Installed as easily as a bumper— no cutting nor drilling of frame!

The man who sells Reid Air Springs can install them and the job is one that any mechanic can easily handle since no cutting nor drilling is necessary.

This appeals to the car owner as well as to the dealer because it does not involve any holdups and the car is not defaced.

And once the dealer has sold one set of Reid Air Springs or displayed them in his window he is

on the way to big profits for no motorist can see them without wanting them.

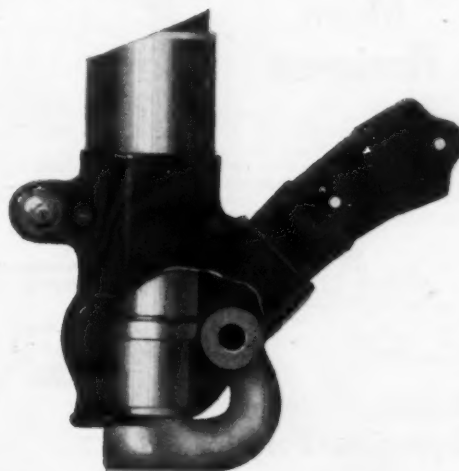
There is in their beauty, and the classy appearance which they give to the car, a compelling sales appeal and the fact that they virtually float the car on air, absorbing all road shocks, makes them a necessity if complete riding comfort is to be had.

Reid Air Springs are amazingly simple in construction — there are only three main parts. An outer housing, which is really the oil and air chamber, and two pistons, one operating in the other, that is all.

The two pistons, working together, against oil and air pressure, instantly take up all shocks — and since their movement, both on the up and down strokes, is snubbed the moment it starts—there is no tendency to upset at sharp turns.

Reid Air Springs are self-lubricating and require no attention. For cars up to 3500 lbs. Protected territories are offered. An attractive proposition — Write today.

The Reid Air Spring Co.,  
New Haven, Conn.

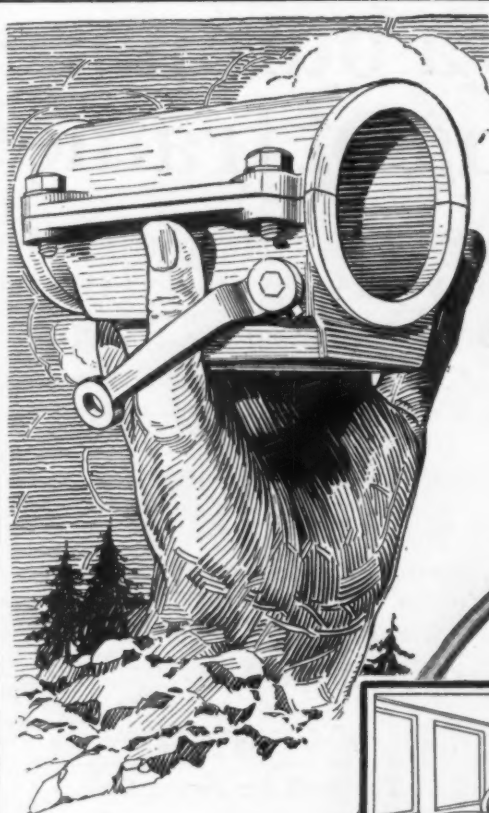


*The installation of Reid Air Springs consists in simply removing the horn from the end of the car frame and inserting and fixing in its place the Air Spring attachment. You take out three rivets and put in three rivets.*

*Reid Air Springs when in place do not raise the car above its normal riding position.*

## REID AIR SPRINGS

FLOAT THE  CAR ON AIR



# The Cooper



Patent applied for

## \$2.50

### Cooper Dash Control

Gives instant and complete control of muffler cutouts, exhaust heater valves, air chokes, radiator shutters. Right at your finger tips, always in sight, fits the hand perfectly—a twist of the wrist locks it in any position. The Cooper Dash Control does not interfere with levers, pedals, or floor board—a feature liked by men who use service batteries. Installed by cutting half inch hole in dash. Made of brass, nicked and polished—an ornament to the finest car.

### Cooper Special (Cut-Out—Testing Valve)

Has many exclusive advantages. It is easily installed—simply cut oblong hole in exhaust pipe and fit Cooper around it. Extra heavy oil tempered drawn steel coil spring and heavy flapper used. Will not chatter. Spring and heavy road axle are not effected by heat, mud or rust. Large elongated opening gives carbon and soot free exit. Means a clean motor, more power, less fuel, longer life to motor. Standard equipment on Paige, Daytona Model and others.

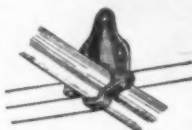
#### PRICE VALVE ONLY

1½ inch.....	\$2.50
1⅝, 1¾, 1⅞.....	3.00
2, 2⅞.....	3.50
2¼, 2⅝, 2½, 2⅞.....	4.00
2¾, 2⅞, 3 inch.....	5.00

Cooper Special Cutout Complete for Fords..... 3.00  
When ordered complete with Dash Control add \$2.50 to above prices. Ask your dealer—Dealer ask your jobber.

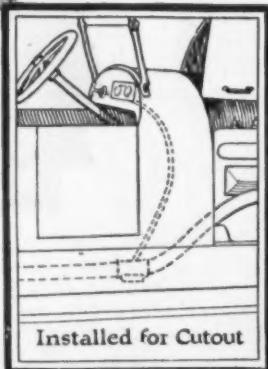
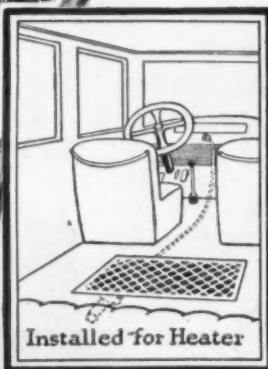
### More Business

Cooper Products are money getters, profit makers for Accessory dealers. Give your patrons clean, silent-running, well tuned motors by installing Cooper Cutouts. They know the Cooper—Ask 'em to Buy.



### Steering Column Support for Fords

Holds steering column absolutely rigid, takes out all vibrations. Adds greatly to comfort of driving especially over rough roads. A strong casting, black finish, fits all Fords having instrument boards, both open and closed models. Packed in individual cartons. Price 75c each.



The Fulton Co., Dept. A  
75th and National Aves.,  
Milwaukee, Wis.

Enclosed find \$..... for Cooper Special Cutout.

For Fords.....with Dash Control.....Cooper Steering Column Support. (Cross out items not wanted.)

Name .....

Address .....

Dealer's or Jobber's Name.....

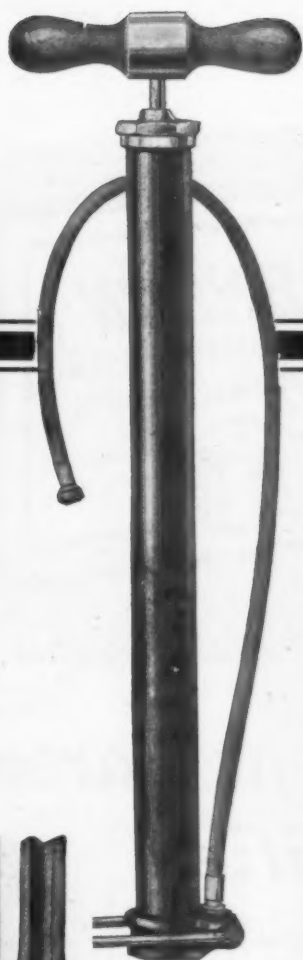
Manufactured by Cooper Mfg. Company, Marshalltown, Iowa

## The Fulton Company

Dept. A. Sales Representatives,  
75th and National Avenues, Milwaukee, Wis.







## The Greatest *Selling* Advantage Ever Built Into a Tire Pump

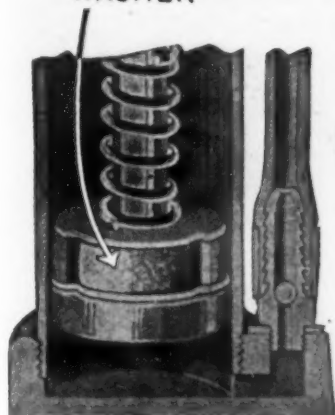
No tire pump on the market today possesses such an outstanding selling advantage as the **patented** Self-Oiling Washer of the MONROE. For it has proved to be the one successful means of keeping valve leathers **permanently** lubricated.

Ordinary pumps have no satisfactory provision for **lasting** lubrication. In consequence, the valve leathers are inclined to quickly dry out and crack, especially if the pump is out of use for any length of time. Compression is lost. The air leaks back into the barrel instead of being forced to the tire.

No matter how long a MONROE Self-Oiler lies idle, the valve leather will never dry out. The **patented** Washer keeps it constantly soft and pliant, making full compression a certainty. Instant, unfailing service is completely and **continuously** assured.

If you are looking for quick turnovers and substantial profits, stock and sell the MONROE. Unquestionably a better pump, it has the added attraction of a low selling price. Let us show you how much it is to your advantage to handle this fast-selling, really reliable tire pump.

PATENTED  
SELF OILING  
WASHER



Before a MONROE Self-Oiler is assembled, this patented washer is soaked in a leather-preserving oil. When the plunger is drawn upward, the action of the spring, above, compresses the washer and releases just enough oil to keep the valve leather, below, permanently soft and pliant. The slightest down pressure on the plunger spreads this softened leather tightly against the inner wall of the barrel, assuring full compression always.

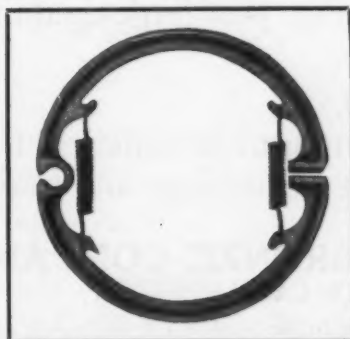
**Monroe Auto Equipment Manufacturing Co.**  
Monroe Michigan

Sales Representative to Jobbers Only  
The Fulton Company

Milwaukee, Wis.

### MONROE BRAKE SHOE FOR FORDS

Insures uniform and even braking for every Ford car. Simple and strong. Easily and quickly installed—no special tools required. You'll find this shoe a snappy business booster among Ford owners.



### MONROE CLOSED CAR SPOTLIGHT BRACKET

A new Spotlight Bracket for closed cars that thousands of motorists have been waiting for. Will fit practically any spotlight on the market. A big winter seller that brings a neat profit.

# MONROE *Self-Oiling* TIRE PUMP



## Packed in Convenient Cartons Easily Identified

Johnson Bronze Bushings and Bearings are packed in convenient and attractive cartons and marked clearly for identification.

*That's the first reason why dealers and jobbers prefer to handle them.*

They are made of virgin metal, to S. A. E. specifications, machined to fractions of a thousandth of an inch and subjected to numerous metallurgical and mechanical tests.

*That's the second reason.*

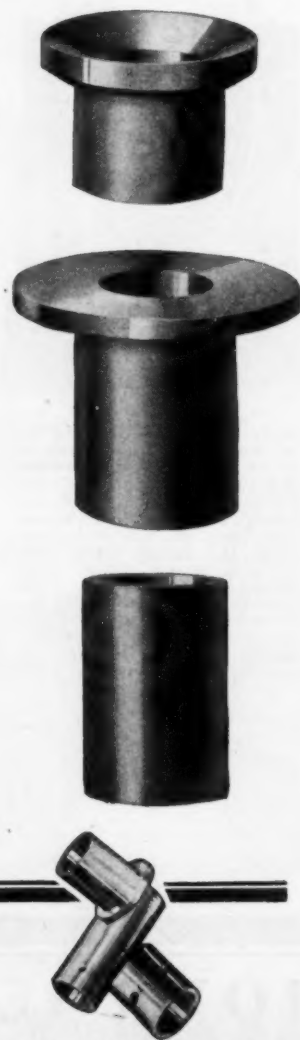
Practically every bushing or bearing required is stocked in great quantities, giving you large-quantity prices on small-quantity orders.

*That's the third reason.*

These three reasons ought to be sufficient to attract your inquiry for our stock list of bushings and bearings.

**JOHNSON BRONZE COMPANY**  
NEW CASTLE, PA.

*"From Pioneer to Recognized Leadership"*




---

# JOHNSON

**BRONZE BUSHINGS AND BABBITT LINED BEARINGS**



**125,000**  
**Sold in December**



*Genuine*  
**D&B**

*Genuine*  
**D&B**

*The Original*  
*Silent Timing*  
*Gears*

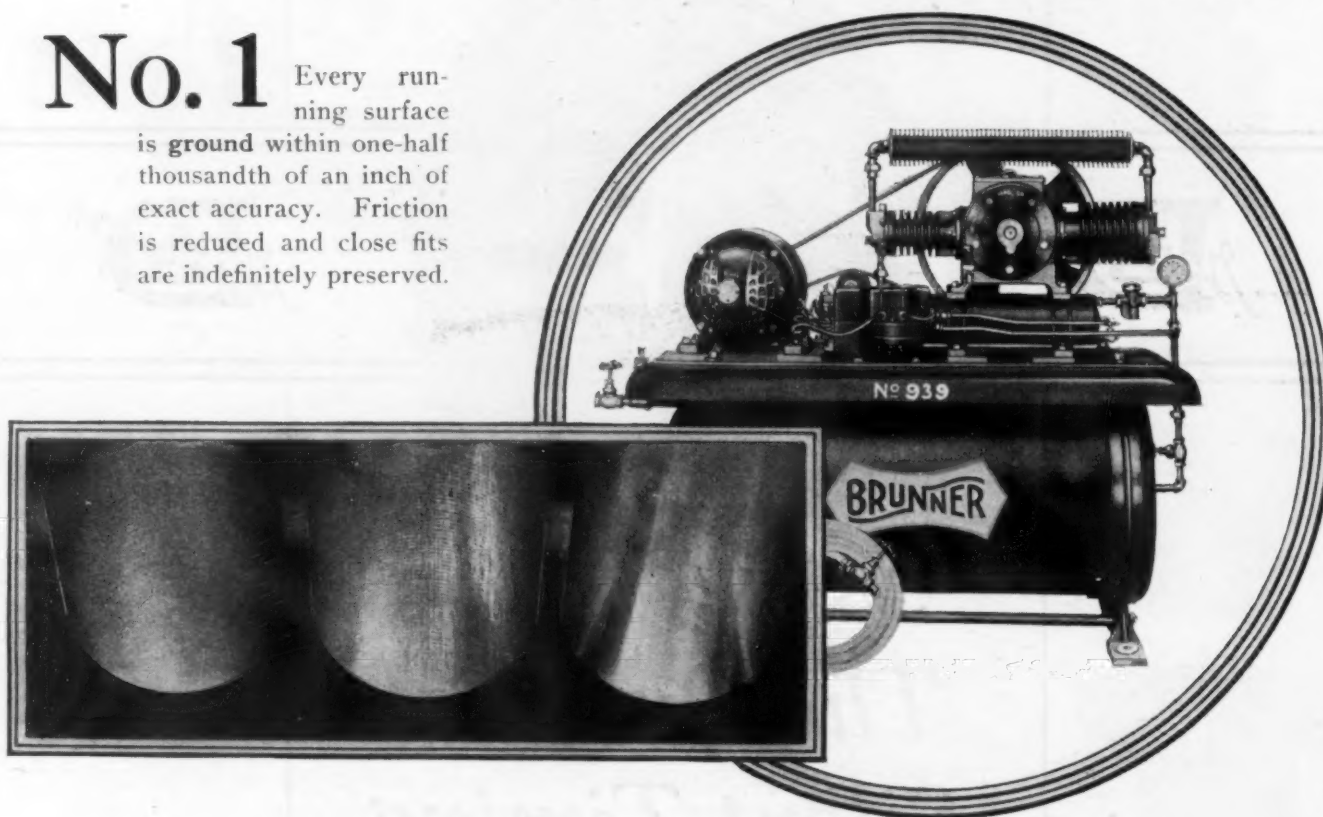
Jobbers and Distributors Everywhere

**DALTON & BALCH**  
2333 Michigan Blvd. Chicago, Ill.  
Incorporated  
*Members of American Gear Manufacturers' Association.*

# BRUNNERISMS

Just 20 Well Established Habits of  
Excellent Manufacturing Practice

**No. 1** Every running surface is ground within one-half thousandth of an inch of exact accuracy. Friction is reduced and close fits are indefinitely preserved.



## How *Smooth* Is Smooth?

What would seem a level roadway to an elephant might look like the Rocky Mountains to a fly.

The difference between roughly surfaced and fully ground pistons and cylinder walls is perhaps most distinctly evident in the long life, and smooth, even performance of the ma-

chines of which they form a part.

These little differences—amounting often to almost infinitesimal fractions of an inch—form the dividing line between ordinary methods of manufacture and the undeviating excellence which is an absolute religion in the Brunner Plant.

*When you buy a BRUNNER your compressor service is insured—for 20 years.*

**BRUNNER MFG. CO., UTICA, N. Y.**

Cincinnati  
1st Nat. Bk. Bldg.

Kansas City  
Grand Ave.

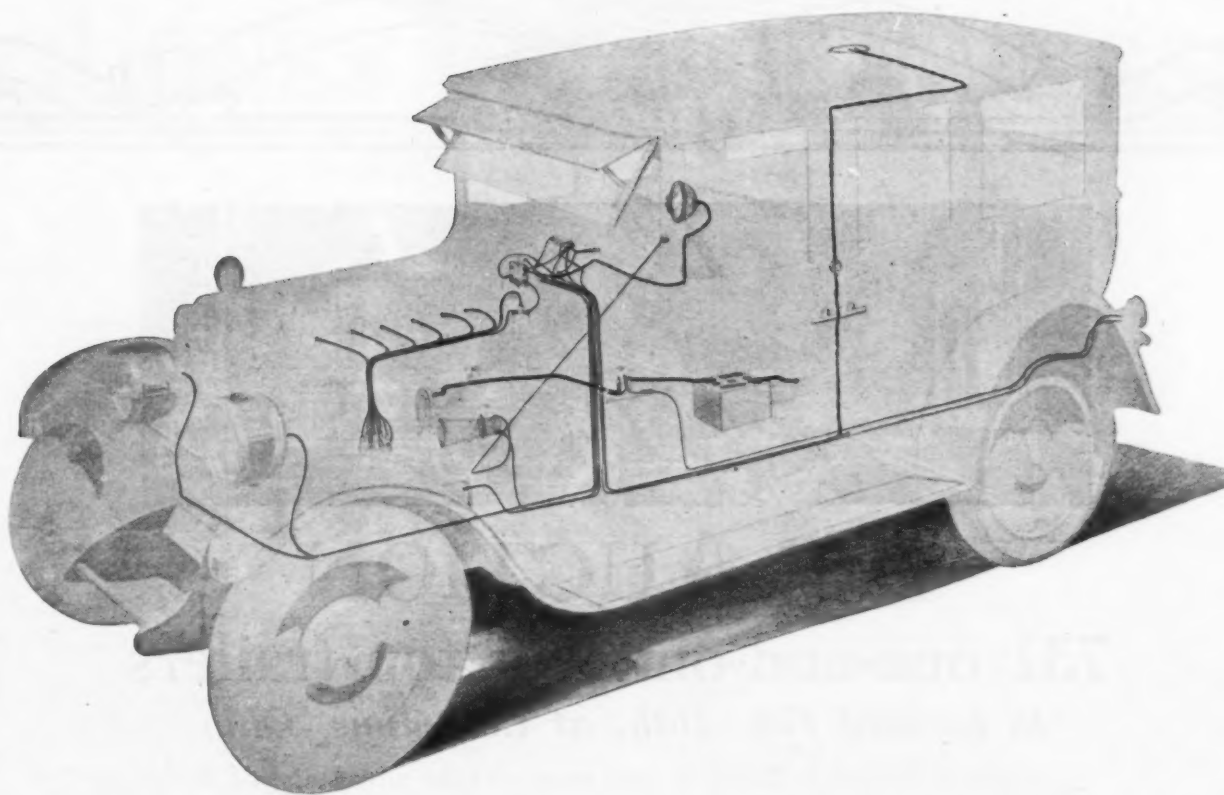
San Francisco  
Santa Fe Bldg.

*Good for Twenty*

**BRUNNER**  
AIR COMPRESSORS

*Years at Hard Labor*





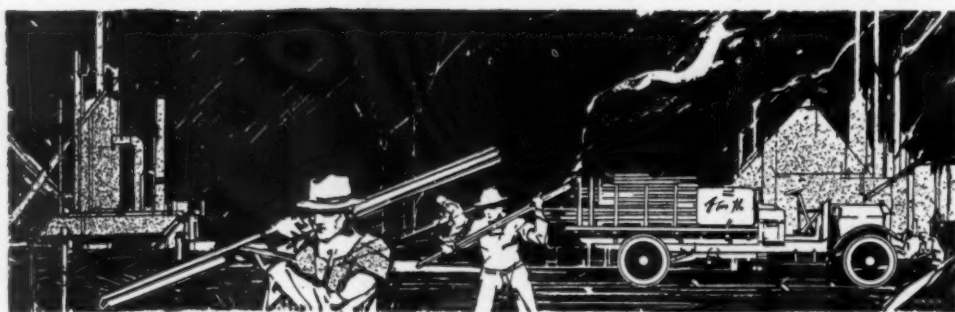
## The Completely Equipped Car

is not going to affect the cable replacement business. There is no better business building line on the market today than PACKARD CABLES—The cable that has a name—The cable that is recognized wherever automobiles are known as of preeminent quality.

We will be glad to show you how a little concentration on PACKARD CABLES can be made to boost your profits and increase your business in other lines. Write for our campaign plan and a Packard Wiring Chart.

**The Packard Electric Company**  
Warren, Ohio

---



## AT AUCTION

### 731 one-and-one-half ton trailers

*to be sold Feb. 16th, at Columbus, Ohio*

You will need to hurry if you want to take advantage of the auction sale offering 731 trailers at Columbus, Ohio, on February 16th.

These trailers are long-bodied, and are readily convertible to your needs, should a shorter body be desired. The materials used throughout are of Government inspected quality, and the trailers are crated ready for shipment.

The Government reserves the right to reject any or all bids.

### *Specifications:*

**Chassis**—Two wheel, light Aviation. Steel disk wheels and pneumatic tires.

**Body**—Platform, 26 feet long and 6½ feet wide with detachable sides and cover bows.

**Weight**—uncrated—3,500 pounds.

**Capacity**—3,000 pounds.

This trailer offering is one of the unusual opportunities the automotive dealer, and fleet operator, will find nowadays in the War Department sales. It is seldom that such high grade new equipment is offered, and that such quantities may be had. These trailers will make an ideal buy for the dealer who wishes to pass on such bargains to his regular customers.

*For catalog and full information, write at once to*

**Q. M. Supply Officer, General Intermediate Depot**  
1819 W. Pershing Road, Chicago, Illinois



# WAR DEPARTMENT



# GURNEY BALL BEARINGS

## Authorized Distributors

### ALABAMA

Birmingham—Birmingham Bearings Co.  
Gadsden—Cox & Williams  
Mobile—Lzard Motor Co.  
Montgomery—C. R. Ballard & Co.

### CALIFORNIA

San Francisco—Irvin Silverberg & Co.  
Los Angeles—Jos. A. Masters & Co.

### DISTRICT OF COLUMBIA

Washington—Bearing Sales Co.

### FLORIDA

Jacksonville—Auto Parts Co.  
107 Clay St., Telephone 7414  
St. Petersburg—Ace Automotive Co., 252 2nd Ave., So.  
Tallahassee—Tallahassee Overland Co.

### GEORGIA

Atlanta—Southern Bearings Co.,  
375 Englewood Ave. Tel. Ivy 7932  
Augusta—Bearings & Battery Service Co.,  
655 Broad St. Tel. 384.  
Albany—Thad Huckabee Auto Co.  
Columbus—J. L. Couch Co.  
Dawson—Lock-Mathis Motor Co.  
LaGrange—Auto Bearings & Supply Co.  
Macon—D. H. Adams Motor Co.  
Rome—Hight Accessory Place  
Thomasville—James Gribben  
Valdosta—E. H. Rogers

### IOWA

Des Moines—Walton, J. M.  
1020 Grand Ave. Tel. Walnut 3354-3088

### ILLINOIS

Chicago—Berry Bearings Co.,  
2711 Michigan Ave.  
Chicago—L. C. Smith Bearings Co.,  
2208 Michigan Ave. Tel. Calumet 277

### INDIANA

Indianapolis—Auto Equipment Co.,  
1021 No. Meridian St. Tel. Main 6373—Main 0363  
Evansville—Lannert Mfg. Co., 210 So. 6th St. Tel. 365

### KENTUCKY

Louisville—Columbia Motor Truck & Supply Co.,  
117 South 7th St.

### MARYLAND

Baltimore—Motor Parts Co., 1419 N. Charles St.

### MASSACHUSETTS

Boston—Units Parts Co.,  
601 Newbury St. Tel. Back Bay 8089  
Springfield—Parmenter Co.,  
680-682 Main St. Tel. Walnut 4900

### MICHIGAN

Detroit—Detroit Ball Bearing Co.  
3958 Cass Ave. Tel. Glendale 2509

### MINNESOTA

Minneapolis—Reinhard Bros. Co., Inc.,  
11 South 9th St.

### MISSISSIPPI

Meridian—E. S. Curtice, 2214 8th St. Tel. 16

### MISSOURI

Kansas City—H. H. Kerr Bearing Co.,  
1933 McGee Trafficway—Tel. Harrison 5077

### MONTANA

Great Falls—Montana Bearings Co., 324 2nd Ave., So.

### NEW YORK

Buffalo—Buffalo Bearings Co., 1030 Main St.  
New York City—R. & L. Bearings Co., 1819 Broadway

### NORTH CAROLINA

Raleigh—Motor Bearings & Parts Co., 403 Fayetteville St.,  
Tel. 2711  
Asheville—Commercial Truck Service Station  
Charlotte—Southern Bearings Co., 12 S. Poplar St.  
Gastonia—Moore & Stewart  
Greenville—Brunson Accessory Co.  
Greenville—Mines Motor Co.

Greenville—W. N. Watson  
Greensboro—Motor Bearings & Parts Co.,  
116 Market St. Tel. 2337  
Kinston—H. H. Hodges Co.  
Rocky Mount—F. P. Dunn  
Salisbury—Odell Motor & Equipment Co.  
Wilmington—W. D. MacMillan, Jr.

### OHIO

Cleveland—Detroit Ball Bearing Co.,  
6537 Euclid Ave. Tel. Randolph 2336  
Cincinnati—N. J. Hebbard Co., 205 E. 8th St.  
Columbus—Bearings Company of Columbus,  
75 So. 4th St. Tel. Main 7319, City 9482  
Dayton—Triangle Wheel Co., 213 Main St. N.

### OKLAHOMA

Oklahoma City—Sharp Auto Supply Co.,  
406 N. Broadway. Tel. 227 Maple  
Ardmore—Anderson Auto Salvage  
Blackwell—Wiggins Motor Co.  
Cushing—O. K. Vulcanizing Co.  
Enid—Strickler & Howell Accessory Co.  
Guthrie—Garlack Bros.  
Muskogee—Anderson Sibbett Co.  
Ponca City—S. & N. Motor Supply Co.  
Tonkawa—Knables Garage

### OREGON

Portland—West Bearing Co.,  
452 Burnside St. Tel. Broadway 5006

### PENNSYLVANIA

Philadelphia—H. P. Schade Co.,  
821 No. Broad St. Tel. Bell Poplar 3770,  
Keystone Park 3012  
Pittsburgh—Gwilliam Company,  
418 Melwood Ave. Tel. Schenley 3143

### SOUTH CAROLINA

Charleston—Atlantic Tire Service Co.  
Chester—Chester Accessories Co.  
Columbia—Whitton Auto Wrecking Co.  
Sumter—R. & S. Bearings Co.  
Spartanburg—Spartan Hardware Co.

### TEXAS

Dallas—Western Gear & Parts Co.,  
317 Bourbon St. Tel. Main 644  
Fort Worth—Western Gear & Parts Co.,  
111 E. Belknap St.  
Houston—Bearings Co. of Texas, 619 Preston Ave.  
San Antonio—Hill Auto Supply Co., 406 E. Travis St.  
Wichita Falls—Hill Auto Supply Co.

### TENNESSEE

Nashville—Automobile Bearings Co., Inc.,  
620 Commerce St. Tel. Main 1969  
Chattanooga—Wallace Buggy Co.  
Knoxville—McNutt & Burks Battery Co.,  
307 No. Central Ave.

### UTAH

Salt Lake City—Geo. J. Silver, 1207 S. 8th East St.

### VIRGINIA

Norfolk—Lintz Ball Bearing Co.,  
729 Granby St. Tel. 25066  
Roanoke—Shockley Motor Co., 109 Church St. Tel. 1466

### WASHINGTON

Seattle—Northwest Bearings Co.,  
601 East Pike St. Tel. 5000  
Aberdeen—Cadwell Transportation Co., 419 E. Wishkah St.  
Bellingham—Tabor & Cruikshank,  
1327 Dock St. Tel. 422  
Centralia—McDowell Bros., 721 No. Tower Ave.  
Everett—White Motor Car Co.,  
2812 Rucker Ave. Tel. Main 205  
Spokane—Auto Gear & Axle Co.,  
1104 W. 1st Ave. Tel. Main 4861  
Tacoma—R. W. Schmack, 714 St. Helena Ave. Tel. Main 1913  
Walla Walla—K. S. Automotive Parts Co.,  
51 Spokane St.  
Yakima—United Parts Service Co.,  
109 So. 2nd St. Tel. 38

## Gurney Ball Bearing Company

Jamestown,

New York



## Listening—

Standing beside the car he bought from you, he listens to the motor.

It has developed noises—as all motors will after hard service.

Upon *how* noisy your motor has become will depend whether he will come to you for his next car.

He may not know that the

metallic grind is caused by steel timing gears. But the mere fact that it is there may make him decide to get a car of different make next time.

One way to cut down noises that develop in service is to equip your cars with timing gears that are *silent*.

## CONDENSITE CELORON SILENT TIMING GEARS ARE ALWAYS QUIET

Because they are *non-metallic*, they never develop grinds, rasps, or rattles.

Because they are resilient, they absorb shocks and cushion contact, minimizing wear and lengthening the life of the engine.

They perform silently and consis-

tently, eliminate all the objectionable noise of metal gears and permanently retain the perfect timing of the gear drive.

Celoron gears can be adapted to any timing gear train. They are already standard equipment on many of America's quality cars.

### Car Owners

If your present timing gears have lost their silent qualities, have your service station or repair man replace them with Condensite Celoron Silent Timing Gears—and forget they exist.

### Diamond State Fibre Company

BRIDGEPORT

(near Philadelphia)

PENNSYLVANIA

BRANCH FACTORIES AND WAREHOUSES

BOSTON

CHICAGO

SAN FRANCISCO

Offices in Principal Cities

In Canada: Diamond State Fibre Company of Canada, Limited, 245 Carlaw Avenue, Toronto





*Where He Wants It—When He Wants It*

## Airco IGNITION GAUGE

*The Original Ignition Gauge Utilizing Neon*

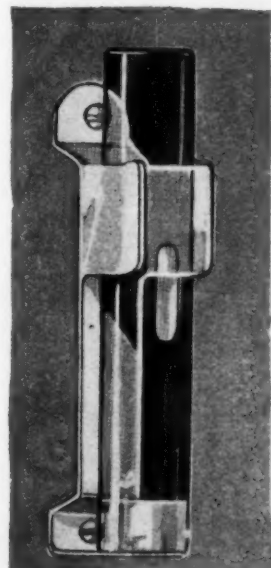
**C**OLD weather is the enemy of good ignition—to be met most successfully by the winter driver who makes frequent use of this Airco Ignition Gauge.

This efficient detector of spark plug and other ignition troubles is now furnished with a nickel-plated clip, designed to be screwed to the dashboard under the hood, within easy reaching distance of the engine. See illustration above.

**AIR REDUCTION SALES COMPANY**

342 Madison Ave., New York, N. Y.

*Pioneer in commercializing the elements of the air*

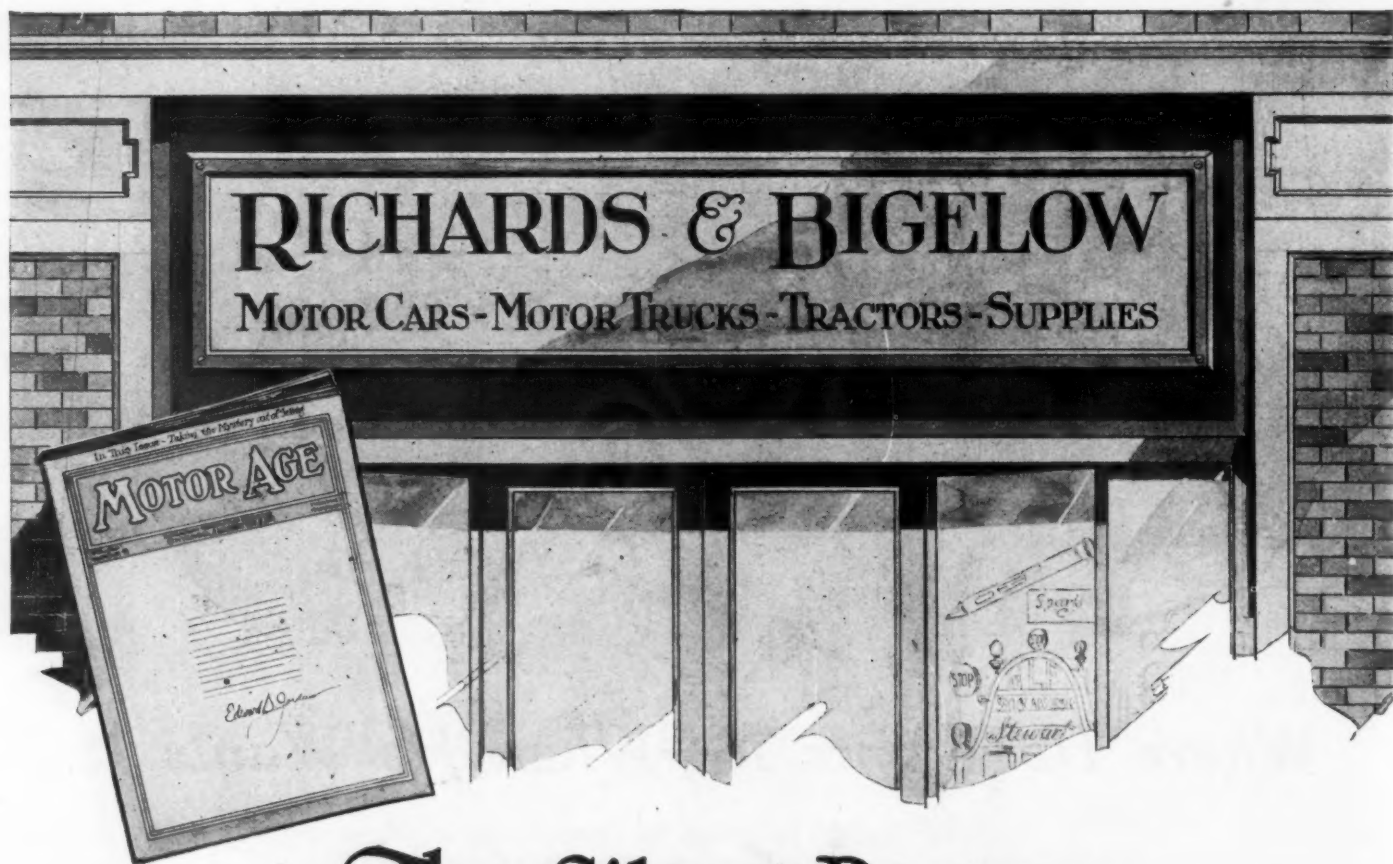


AIR REDUCTION SALES CO.  
342 Madison Ave., New York City  
Gentlemen:  
Kindly send me a new clip for my Airco  
Ignition Gauge. I enclose ten cents in stamps  
to cover packing and mailing.

Name .....  
Street .....  
City and State.....

TEAR OFF AND MAIL TODAY





## —The Silent Partner

To thousands of progressive automotive merchants MOTOR AGE is a source of sound advice and helpful suggestions. To these men it holds much the same position as a silent partner. It gives wise and varied counsel. It cites the experiences of other men. It warns of "get-rich-quick" methods, yet advises sweeping away the cobwebs.

In short, MOTOR AGE brings to an army of readers the kind of information that only a leading business paper can gather together. The sincere, unbiased manner of presenting this information has won for this paper a healthy, whole-hearted respect from men who are shaping the destiny of the automotive trade.

Those who read MOTOR AGE are progressive, thinking men. Those who advertise in it are in good company.

# MOTOR AGE

5 So. Wabash Ave., Chicago, Ill.





*"They're Always  
In Stock"*

## Here's the Bushing You're Looking For



There is a certainty of satisfaction in the application of Bunting Bushings that enhances the value of service. They always fit the car and part for which they are made.

They always represent the best that modern methods can produce.

They are known and recognized everywhere as the fine product of an old, established organization that has successfully specialized for generations in the production of Bronze bushings and bearings. The solid reputation of a product that has

faithfully served all industrial trade classes for years underlies the quality of every Bunting Bushing.

Piston Pin Bushings Ready Made for all popular cars, trucks, tractors and motors are shown in stock list 18. Manufacturers, jobbers and repairers are invited to write for it.

154 different sizes of Ready Made Bronze bushing bearings for all general machinery, carried constantly in stock are shown on stock list BB. Write for it.

### The Bunting Brass & Bronze Company

759 Spencer St., Toledo, O.



New York  
245 W. 54th St.,  
Circle 6844

Cleveland  
1362 E. 6th St.,  
Main 5091

Boston  
36 Oliver St.,  
Main 8488

San Francisco  
198 Second St., Cor. Howard  
Douglas 6245

Chicago  
722 S. Michigan Ave.,  
Wabash 9153



# BUNTING BUSHING BEARINGS

PATENTED

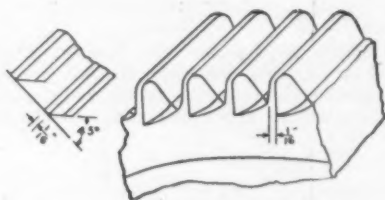


## Cut to Specifications of Makers of the Bendix Drive

You can't go wrong if you install a Huetter Fly-Wheel Gear Band on a stripped fly-wheel job—because Huetter Bands are chamfered to specifications recommended by the manufacturers of the Eclipse Bendix Drive!

### Quiet, Positive Meshing

is assured by this identical pointing. Strength is retained where it is most needed—in the point of the tooth. Besides, Huetter Gears are machined out of hard, tough steel, electric welded, and you can give your customer a job that will last the life of his car. Huetter gears are pointed on *both* sides, making them interchangeable—which means a lower stock for you. This feature is fully covered by patents.



See the pointing recommended by the Bendix Drive manufacturers—



Then notice the pointing of the Huetter Fly-Wheel Gear Band—not only similar, but identical!

**New Price List Out—Send for It!**

**Huetter's**  
Fly-Wheel Gear Bands  
HUETTER MACHINE & TOOL CO.  
545 Kentucky Ave. INDIANAPOLIS



# Test the SAAL Pressure Oiling System At Our Expense

Millions  
Will Be Used



THIS remarkable offer is made because we want you to know there is an active demand for the SAAL High Pressure Chassis Oiling System—sold by leading jobbers complete in handy package form. We want to give you the opportunity of testing it on your personal car but we cannot pass out samples indiscriminately. Here is our proposition—good only for 30 days:

	List	Dealer's Price
Ford, Chevrolet, Overland, Star and Gray Systems	\$5 <sup>00</sup>	\$3 <sup>34</sup>
Complete System for all other cars	\$8 <sup>00</sup>	\$5 <sup>34</sup>

## Order One—We'll Send You Two

Bear in mind—this offer is for either priced system in the regular retail package. Order one on the coupon below as evidence of good faith. We'll send you TWO systems postpaid—one absolutely free.

## Make This "Appreciation" Test

This special inducement is made so that you may equip your own car with the Saal without cost and learn for yourself that it can be installed in a fraction of an hour, that you may test the advantages of heavy oil over grease as a chassis lubricant and that you may see and learn how the Saal Oil Gun develops tons of pressure which will force live, heavy oil lubricant through the dryest, caked bearing—thoroughly cleaning the parts as well as lubricating them more effectively.

H. G. SAAL COMPANY, 1803 Montrose Ave., Chicago  
(Established 22 years)

# SAAL

HIGH PRESSURE  
CHASSIS OILING

# System

H. G. SAAL COMPANY  
1803 Montrose Ave., Chicago

Gentlemen: We want to test the Saal System according to your offer, with the understanding that if we do not find it the best we've ever seen, our deposit will be refunded. Please send us TWO [Large or] systems for the price of one. [Small]

Name of firm.....

Address..... City..... State.....

Name of Jobber.....

Signature.....



## It's so Easy Now

Resizing cylinders the modern way—the AUTO-HONE way—is a matter of only a few minutes to a cylinder—without removing the engine bloc from chassis. It used to take three or four days to resize cylinders—now the whole job is done in a couple of hours.

*The difference between the hours and days is  
PROFIT*

Every Garage and Service Station can have this profit—can make this profit.

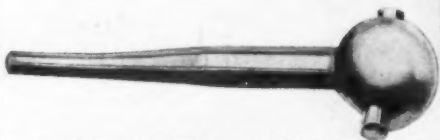
Don't miss it—don't pass it over—don't delay getting it. Investigate now—at once—today. Profit builds fast with an AUTO-HONE.

The coupon brings information that reveals how simple and easy a matter it is to resize cylinders the modern way—and make much more money.



*No skilled help is required to operate the Auto-Hone.*

*Any mechanic's helper can resize cylinders with it—it is so simple and effective.*



The AUTO-HONE CO., 1587 Main St., Buffalo, N. Y.

Gentlemen:

Please send at once complete information and prices of the Cylinder AUTO-HONE. This does not obligate me in any way.

Name .....

Address ..... City..... State.....

## THE COMMERCIAL VEHICLE

A magazine for the Fleet Owner, furnishing reliable and accurate news, information and advice on how to economically operate fleets of motor vehicles.

Contains statistics, diagrams and special articles, treating of successful truck operation in all the different trades and industries—Department Stores, Contractors, Shoes, Coal, Wood, Lumber, Dry Goods, Oil Delivery Companies, Bus Lines, Telephone Companies, etc., etc.

Read by leading Fleet Owners throughout the country—men, firms and corporations who own and operate from 5 or 10 up to hundreds of motor vehicles. One subscriber, for instance, owns and operates upwards of 1800 Trucks and maintains 30 Garages and Service Stations. THE COMMERCIAL VEHICLE is the only publication in this particular field and is a real necessity to Traffic Managers, Garage Superintendents and others who look after the care and operation of fleets of motor cars, trucks, busses, etc.

THE COMMERCIAL VEHICLE is published twice a month, on the first and fifteenth. The subscription price is \$2.00 a year (\$2.50 west of the Mississippi). Sample copies will be sent upon request.

## THE COMMERCIAL VEHICLE

239 West 39th St.  
New York, N. Y.





**EXTERNAL  
BRAKES  
RELINED IN**

**90  
minutes**

**OR LESS**

**By the  
MULTIBESTOS  
METHOD**

Boys, I wish you all had radios. I'd talk, and I'd talk *shop*. And you'd sure want to listen in!

I'd talk *money*. I'd tell you how 2334 garages and repair shops are making BIG money. I'd tell you all about the Multibestos Method of relining external brakes in 90 minutes or less.

I'd tell you how to get the business through lower prices, quicker service and better work. I'd show you how to make *two to ten times* the brake relining profits you've ever made before!

Since I can't broadcast my story on the radio, I've prepared a little book that tells it all. I'll gladly send your copy — FREE. *Don't miss it!* Mail the coupon today.

*E. C. Miner*

Sales Manager, Multibestos Company

**MULTIBESTOS  
BRAKE LINING**

factory equipment on 60% of  
American cars and trucks

MULTIBESTOS COMPANY  
E. C. Miner, Sales Mgr.,  
WALPOLE, MASS.

Send your FREE BOOK showing  
how to reline external brakes in 90  
minutes or less.

Name \_\_\_\_\_

Business or Occupation \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_



## Advertising road maps route business to your door!

**I**NCREASE sales and accumulate "good-will" by distributing RAND McNALLY Advertising Road Maps. Thousands of the leading concerns in the automotive industry are using this type of advertising successfully—automobile, tire and accessory manufacturers, garages and service stations. And so can you!

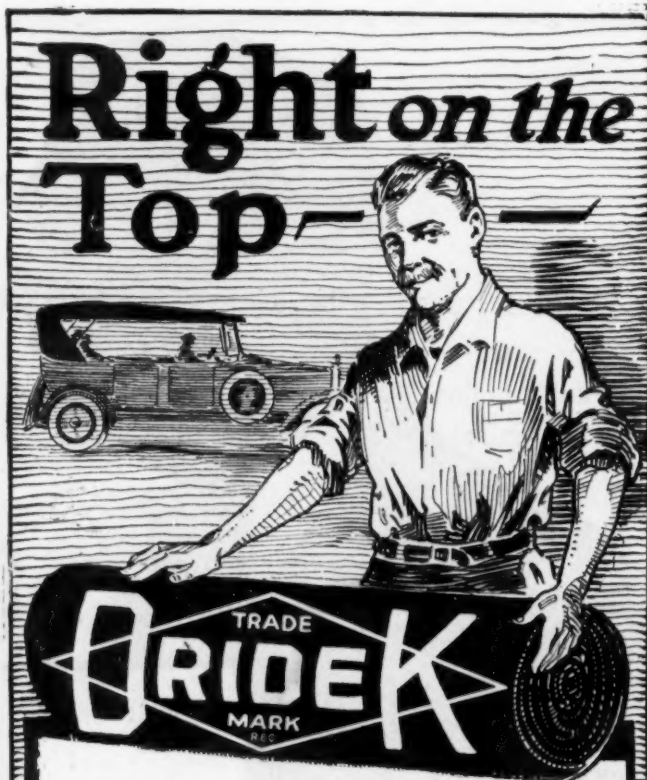
One hundred per cent of your customers are going somewhere. All are interested in maps and many inquire about routes and the location of garages and service stations. Give each customer a RAND McNALLY road map in a cover bearing your advertising. 100 per cent interested circulation!

And you secure the lasting patronage of the motorist, for you have done him a real service. You have saved the time of your employees by answering the customer's inquiry in the quickest, most intelligent way.

You can use RAND McNALLY Official Auto Trails Maps in covers prepared especially for you, or a special territory folder of the section in which you operate. The expense is surprisingly small. RAND McNALLY Advertising Road Maps may be bought economically in small quantities!

*Write for sample Advertising Road Maps.  
Let us explain in detail how profitable  
this type of advertising can be to you.*

**RAND McNALLY & COMPANY**  
Dept. P-53, 536 S. Clark Street, Chicago



## Right on the Top well expresses Dridek quality in every way.

Absolutely waterproof, can be folded and creased without marring the surface and it stands up under the most continuous kind of hard wear.

Every yard in every piece is carefully inspected both in the finish and in the fabric used and the quality is always the same.

Place your orders where you get your money's worth in service and satisfaction.

Dridek makes the ideal automobile top.

Send for samples  
and prices.

**L. J. MUTTY COMPANY**  
Boston Dept. C Mass.





## Stands everything And stands it well!

A Radiator Hose has to stand everything! There is the steady heat of the motor—the destructive action of steam, hot water and oil. If there is one part of an engine equipment which *must be good* it is the Radiator Hose. If there is one Radiator Hose that is *good* it is Goodrich.

### The Goodrich Radiator Hose (sold in 3 ft. lengths)

—is a giant for endurance. Through and through, end to end the rubber is designed, prepared and treated to stand the incessant demands made upon it.

### The Goodrich Radiator Hose (sold in 3 ft. lengths)

—gives long service as well as good service. It makes for a satisfactory job and it makes for satisfied customers.

There is also a special Goodrich Radiator Hose for Ford Cars.

You can't go wrong with Goodrich Radiator Hose and you are sure to go right, so:

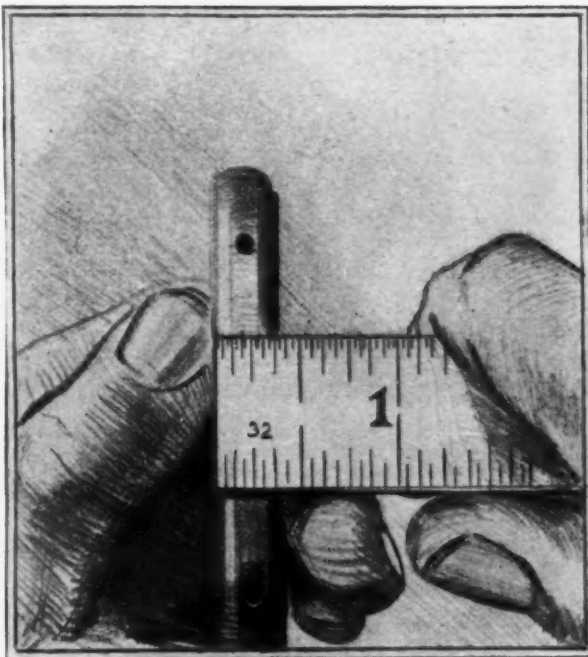
Write your Goodrich Branch  
for a supply

THE B. F. GOODRICH RUBBER COMPANY  
Akron, Ohio

# Goodrich

## RADIATOR HOSE

"Best in the Long Run"



## A REAL Thrust Bearing for Fords

It is possible to buy thrust ball bearings for the Ford car rear axle from a mail-order catalog—but no repairman wants to risk his reputation.

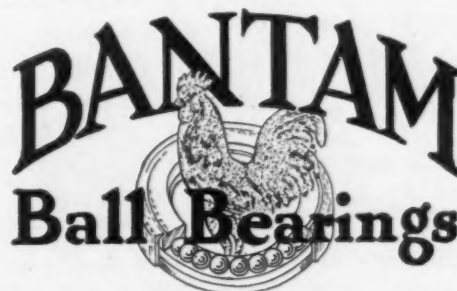
Bantam F-40 is something different.

It actually transforms any Ford or Chevrolet. Gets more power to the rear wheels. Makes these cars climb better, coast farther, give greater gasoline mileage. Eliminates NOISE.

Bantam F-40 has heat treated collars, ground raceways, 40 highest grade steel balls, solid bronze retainer—steel band to hold bearing together.

Every Ford owner wants F-40 installed once he sees it. Chevrolet owners too. A real winter overhauling opportunity.

Your distributor carries F-40 in stock. If he cannot supply you, write direct to one of the addresses below.



BANTAM BALL BEARING CO.

Pioneer Manufacturers

**Bantam,**

Detroit Office  
905 Dime Bank Bldg.

F. M. Boyd, The Avon  
6 East Read St.,  
Baltimore, Md.

**Conn.**

Frank M. Cobbledick Co.  
1031 Polk St.  
San Francisco

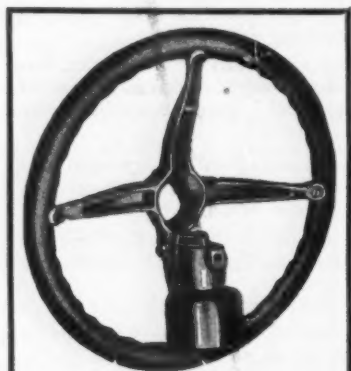


## *The Holmes* Automobile Wrecker

Try To Stump It!

Ask Your Jobber

Manufactured by  
**Ernest Holmes Company**  
Chattanooga, Tenn.



**Lowery FreeWheel**  
"The Steel Enclosed Lock"  
SIMPLICITY — BEAUTY  
STRENGTH  
for  
Fords and Chevrolets

## We Have Reduced The Price

THE favor with which the Lowery FreeWheel has been accepted by the motoring world has been far beyond our expectations and we believe that it is without precedent; the result being that we are now in position to manufacture on a much larger scale.

This being the case we are able, by reason of this quantity production, to buy materials in larger quantities and to produce the finished product at a much lower price. We are, therefore, making an attractive reduction in the retail price without affecting the dealer.

Lock and  
Oversize, Tilting  
Walnut Wheel  
NOW

**\$15**

Represented in the  
North by—  
**PREFERRED  
UTILITIES  
COMPANY**  
Philadelphia  
New York, Chicago  
Brooklyn, Newark  
Providence and  
Albany

## LOWERY & BLAKEMAN

Incorporated

Manufacturers of Automotive Devices

ATLANTA, GA.





## Here's a Big One

There's a story attached to this broken bolt. It came out of the engines of a large lake steamer. The man in charge of the repairs decided he must drill and chip this big bolt out, and, perhaps, retap. In fact, he had begun the job. Along came the engineer and said: "Jim, why don't you use an



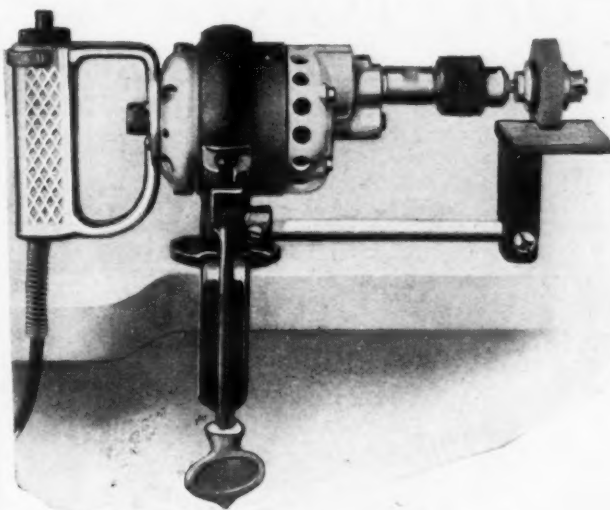
Result. This bolt was out one minute later. It was a tough one. See how the extractor gripped the sides of the broken bolt. But it saved hours of time.

Ezy-Outs will remove any broken bolt from small electrical parts to great cylinder head stay bolts—and save hours of time over a year's period.

You should have a set in your shop.

Ask your dealer or write us for particulars.

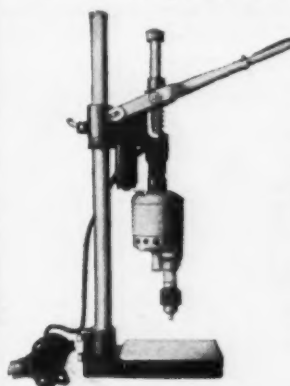
The **CLEVELAND** **CLEVELAND** **TWIST DRILL COMPANY**  
CLEVELAND  
NEW YORK - CHICAGO - LONDON  
TRADE MARK REG. IN U. S. AND FOREIGN COUNTRIES



## Look at These Low Prices

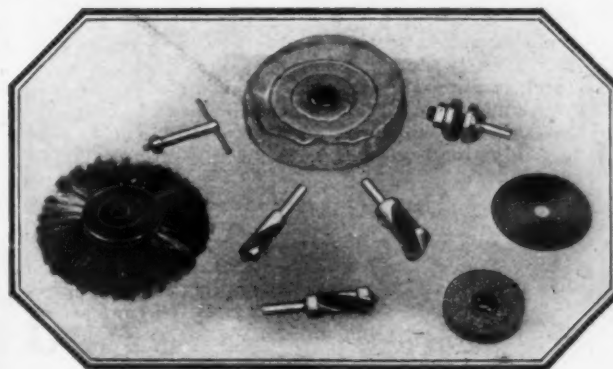
The Jones Electric Hand Drill, illustrated above, is a compact, powerful tool of  $\frac{1}{4}$ -in. capacity thru steel, equipped with a high speed universal motor ventilated to eliminate heating and a Jacobs chuck. It sells for the low price of \$25.00.

By means of certain attachments, shown below, and sold at slight additional cost, this drill can be clamped to a bench and made a *complete machine shop in one tool*. Grinding, polishing, buffing, sawing or light milling, counterboring, etc., can be done quickly and cheaply.



The Jones Automatic Bench Drill Press, illustrated here, is a wonderful little tool for production or tool room drilling. Its capacity, motor and chuck are the same as the hand drill. It is automatic, using power only when drilling. It sells for the unusually low price of \$45.00.

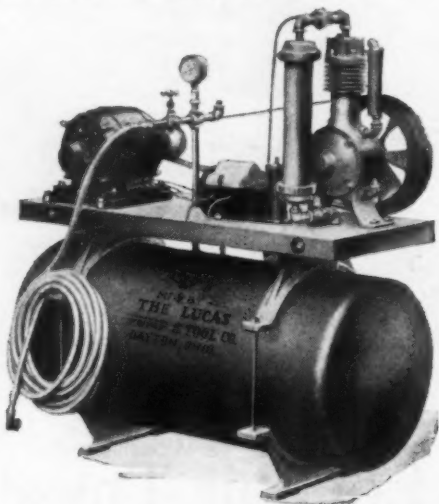
Write us today for descriptive folders on both of these remarkable tools.



Agents Wanted

**JONES DRILL & SPECIALTY CORP.**  
245 Seventh Ave., New York City

## DAYTON SINGLE AND TWO STAGE AIR COMPRESSORS



*Low Priced!* The price is shaved right down close to the cost of manufacture. The cost of manufacture is low because the design is simple.

*Economical!* Dayton Compressors have fewer parts—fewer parts to oil. These compressors start against no load, and embody many other advanced features that save time and money. Send for a catalog, make a comparison and see if we're not right.

**THE LUCAS PUMP & TOOL CO.**

430 Valley St., Dayton, Ohio

## To be frank

it is our opinion that you can sell GLOBE Automotive Products easily with ample profits.

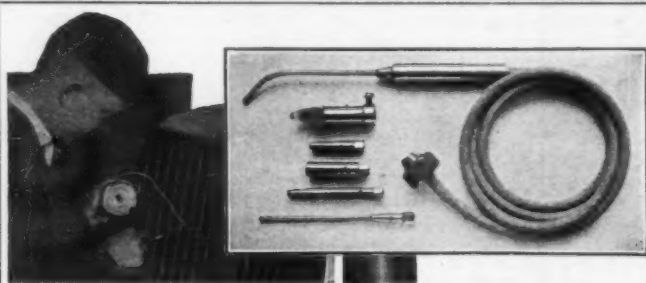
This is verified by the great number of GLOBE Boxes and Signals sold during the past year.

If you don't sell GLOBE Boxes and Signals, order a stock from your jobber now.



**The Globe Machine & Stamping Co.**  
Cleveland, Ohio

*World's Largest Producer of Metal Tool and Battery Boxes, also Stop Signals.*



## TORIT TORCH OUTFIT NO. 13 Does Soldering in $\frac{1}{4}$ the Usual Time

Whether the job is lead burning, battery sealing, fender straightening, radiator soldering or loosening a rusty or corroded nut, the Torit, No. 13, torch is always ready at a second's notice to serve you, and the price is wonderfully low. It is handy for soldering tinware, babbiting, joining light tubing, aluminum soldering, soldering electrical connections, etc.

### USES ACETYLENE ONLY

A splendid use for discarded auto acetylene tanks. Many owners make the Torit, No. 13, pay for itself in a single day. Torch, with 4 different tips, soldering copper, 5 ft. tubing and connection for auto acetylene tank.

**\$7.50**

ORDER YOUR TORCH TODAY

**St. Paul Welding & Mfg. Co.**

169 W. Third St.,

St. Paul, Minn.

## Handle "Stays Put"

*Note the Set Screw and Spring  
One of Seven Superior Parker Features*

**N**O more pinching of fingers as happens on ordinary vises when the handle slips.

Parker Vises are built to stand the "gaff" and are backed by 81 years of progressive manufacturing experience. Tell us what particular type of vises your work calls for and let us send you Parker Feature Folder No. 9.



*The Charles  
Parker Company  
Master Vise Makers.  
Meriden, Conn. U. S. A.*

**PARKER  
VISES**

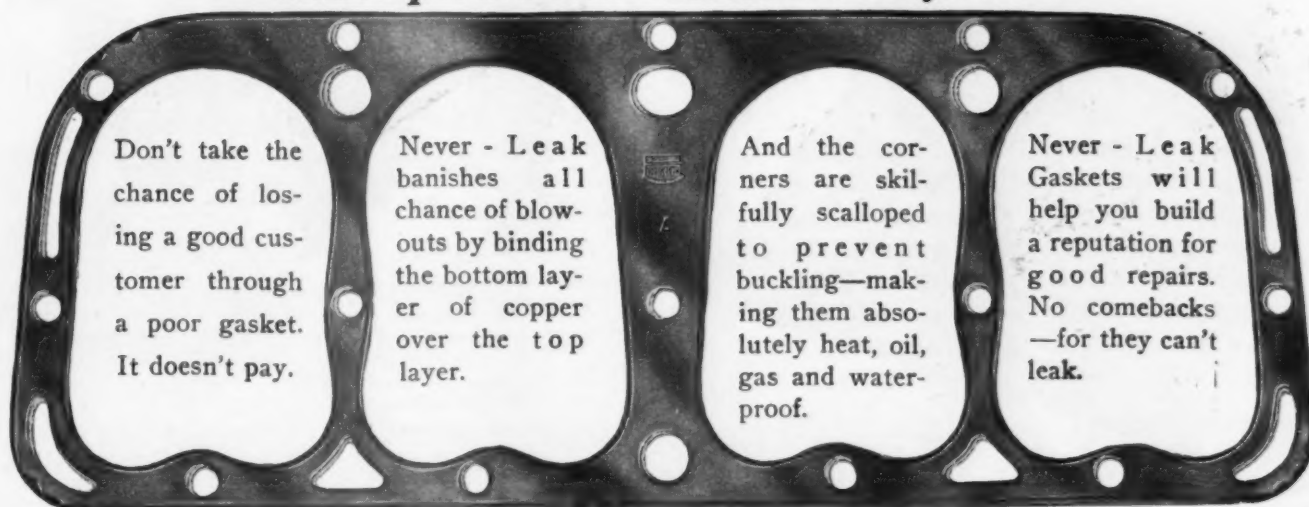
Grip  
Like a  
Grizzly





## Can't Blow Out—Serve Longer

—insure permanent customer satisfaction



Don't take the chance of losing a good customer through a poor gasket. It doesn't pay.

Never - Leak banishes all chance of blow-outs by binding the bottom layer of copper over the top layer.

And the corners are skillfully scalloped to prevent buckling—making them absolutely heat, oil, gas and water-proof.

Never - Leak Gaskets will help you build a reputation for good repairs. No comebacks—for they can't leak.

A sample gasket for any car, truck or tractor sent on request, either direct or through your jobber.

Never-Leak gaskets are listed, pictured and priced in our catalog—copy sent on request.

THE FITZGERALD MFG. CO.

TORRINGTON, CONN.

## NEVER-LEAK Cylinder Head Gaskets

## Repairmen—

You can now get the Eagle Aligning Fixture either as a Universal or Special device—to meet your exact needs. The Eagle has many advantages. Its superior features help you to turn out overhaul jobs that are highly satisfactory.

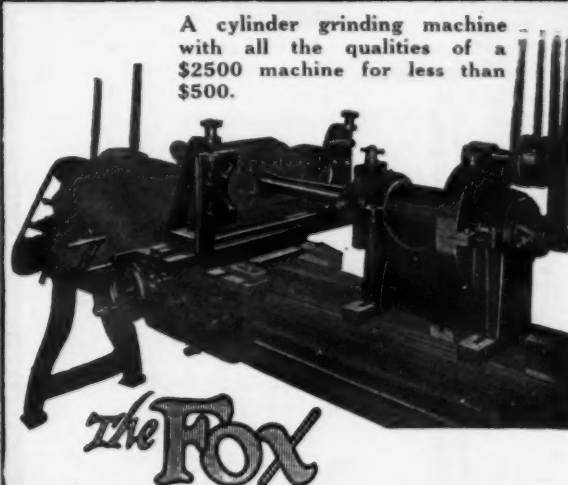
### Greater Profits

The Eagle Aligning Fixture with its patented bushing gives unusual service at small cost. It proves wrist pins, bushings, connecting rods and pistons true and square—before they go into the engine. Accurate work makes satisfied customers and this brings you repeat business. The Eagle Aligning Device helps you get this repeat business and greater profits.

See your Jobber today or write us for information.

**Eagle Machine Co.**

24 N. Noble Street  
Indianapolis, Ind.



A cylinder grinding machine with all the qualities of a \$2500 machine for less than \$500.

### Cylinder Grinding Outfit

A lathe attachment that allows you to bore and grind cylinders in your own shop. You can buy it on terms and a few jobs will pay for it. Why ship blocks out of town when you can make the other 90 per cent with a Fox and do just as good work? Can be attached or taken off in ten minutes. Write today for the Fox booklet.

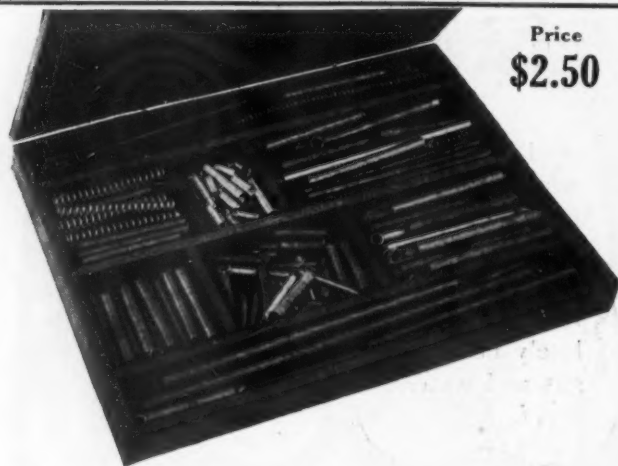
**SUNDERLAND**

Machinery and Supply Co.  
Machine Shops

Omaha

U. S. A.

## Springs For All Purposes



Price  
**\$2.50**

Peck's Assortment of coil springs contains about everything needed in the busy Garage, Service Station and Repair Shop in the shape of springs. It is also a ready seller over the Accessory counter. The car owner finds it to be just what he wants and needs. Always ready—no stopping to

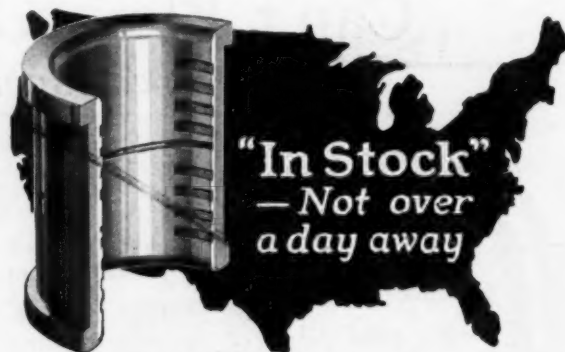
make—no waiting—just reach into the box and pick out what you want.

Peck's Assortment of Coil Springs comes to you in a well built wooden box, partitioned off into convenient spaces. Handy, efficient, good. Order your box today. Jobbers—write us for prices and discounts.

**THE PECK SPRING CO.**

PLAINVILLE,

CONN.



**W**HEREVER you are, Milwaukee Bearings are "not over a day away"! Four hundred distributors—covering every state in the Union—are ready at moment's notice to serve you from a complete stock of Milwaukees.

Did you ever have a customer who didn't want his car in a hurry? They all do! And right here is where Milwaukee Bearings keep promises for you.

And they're real bearings, too—virgin metal, ten times micrometer tested. Get our FREE car, truck and tractor list, with name of stock nearest you.

Milwaukee Die Casting Co., Milwaukee, Wis.

**MILWAUKEE** "Not Over a Day Away" **BEARINGS**

**DELUXE Products**



Day by day,  
In every way—  
*The DeLuxe Tire Pump  
is best!*

Only \$3.50 Retail

ORDER DIRECT  
SPECIFYING  
JOBBER

*The*  
**DeLuxe**  
TIRE PUMP

INDIANAPOLIS PUMP & TUBE CO.  
INDIANAPOLIS

Also  
ARVIN HEATERS  
DE LUXE,  
DELUXE VENTILATORS

## Your Reputation Is at Stake

Every time you do a job of overhauling on a customer's car your reputation gains or suffers according to the way the car performs. Especially is this true of engine work. Unless the pistons and rods are perfectly aligned knocks will develop. Make sure of your work by checking the pistons and rods for accuracy.

## WALLER

**Connecting Rod  
and Piston Aligner**

A precision jig that detects instantly pistons worn out of round or bored crooked, bends and twists in connecting rods and any misalignment in the piston and rod assembly.

Complete equipment with Ford size arbor \$16.00. Bushings for other size crankshafts \$1.00 each. Your jobber will fill your order promptly.

Jobbers—Write for details.

**Waller Mfg. Co.**  
Oelwein, Iowa

The Clucker & Hixson Co.  
Sales Representatives

47 Murray St.,  
New York

52 E. 11th St.,  
Chicago

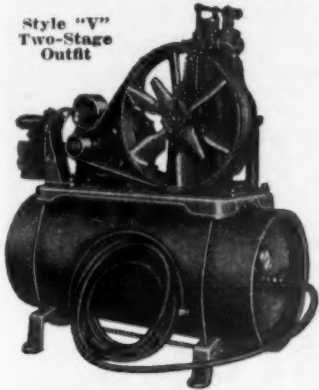


**\$16**  
Complete



# CURTIS SINGLE AND TWO-STAGE AIR COMPRESSORS

Style "V"  
Two-Stage  
Outfit



## An Original Design

The efficiency of a two-stage compressor depends on how thoroughly the air is cooled in the intercooler. Copper throws off heat faster than any other metal—it is used exclusively on Curtis intercoolers, thus assuring fullest advantage of two-stage compression.

CURTIS is recognized as a pioneer in the air compressor field. Sixty-nine years' manufacturing experience, twenty-six of which have been devoted to pneumatic machinery, has enabled us to develop compressors entirely original in design. As a result, Curtis Outfits have many exclusive features that assure dependable service with minimum upkeep.

## Get the Facts

We manufacture a complete line of single and two-stage outfits—a size, style and arrangement to suit your needs. There are definite reasons why you should insist on a Curtis. Write at once for full details—our proposition and prices.

### CURTIS PNEUMATIC MACHINERY CO.

1527 Kienlen Ave., St. Louis, Mo.

#### Branch Office:

530-H Hudson Terminal, New York City

#### Canadian Representative:

Joseph St. Mars, Winnipeg and Toronto, Can.

## FIRST AND ONLY Two-Stage Compressor with a Copper Intercooler

Buy no innering not protected by our Guarantee Tag. Imitations can not equal Genuine Innerings.

**APEX Innerings**  
(Inside Piston Rings)

**Guaranteed To Stop Oil Pumping and Piston Slap Or Money Back**

Thomson-Friedlob Mfg. Co.  
PEORIA, ILL.

**30 cents**

ea. up to 3/4" wide or 5" dia. (Larger 50c.) Order at least a dozen sets today. If jobber has none write direct. State sizes wanted. "Satisfactory in every way." — C. C. Popper, Bucyrus, O. "Increased compression, no piston slap." — H. W. Gross, Kovi, Wyo.

**MAKE USED MOTORS RUN, PULL, LIKE NEW**

Genuine Apex Innerings fit in piston ring groove forming a flexible cushion under the regular rings. Centralize pistons holding them to proper alignment with cylinder walls. Only device ever invented that stops oil pumping, piston slap and adjusts piston rings to fit tapered and egg shaped cylinders without reboring. Form perfect oil and power tight seal. Power can't leak through; oil can't pump past. Thousands of garages are installing Genuine Apex Innerings in used motors to greatly increase the selling price. Hundreds of jobbers stock them. Millions are in use in this and foreign countries. Your customers want you to install these money makers in their cars, trucks, tractors.

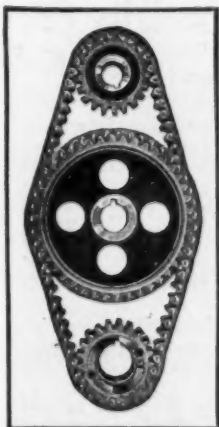
**Thomson-Friedlob Mfg. Co.**  
Peoria, Dept. C Illinois

Chicago Branch: 2332 S. Michigan Ave.

## OVER 50,000 MILES NOW REPORTED ON "WHITNEY"

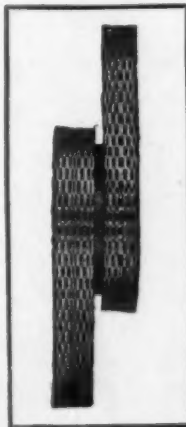
High Efficiency

FRONT END MOTOR CHAIN DRIVES AND STILL IN GOOD CONDITION



NOT ONE OF THESE CHAINS HAS BEEN KNOWN TO SKIP A SPROCKET TOOTH

Interchangeable on the Sprockets Furnished with the Car



**The Whitney Mfg. Co.**  
HARTFORD, CONN.

Cut-in hardened, heat-treated steel

# LOGAN FLYWHEEL RING GEARS

Make big profits replacing stripped and battered flywheel gears with Logan Ring Gears.

Saves the delay of sending for new flywheel and means a flywheel that is better than new.

Logan Ring Gears are of highest quality — with gears cut to accurate pitch and cham-

fered to mesh perfectly with starter pinion.

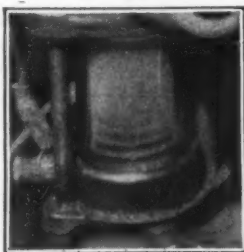
Put old flywheel in lathe and turn off battered teeth, then shrink on Ring Gear. Not difficult at all.

A real service at a real profit and new gears that can never give trouble again.

Write for the details today.

**Kauffman Metal Products Company**  
Bellefontaine, Ohio

## START YOUR CAR INSTANTLY ON THE COLDEST DAY



Actual photograph of Sure Start operating in glass demonstrating manifold. Converts gasoline into vapor, instantly exploded on the first turn of the starter.

By Installing  
**SURE START**

Saves Your Battery

Priced, \$3.50-\$4.00-\$4.50-\$5.00

Dealers—See your jobber for our liberal proposition on this seasonable device.

Write for complete information.

EDWIN L. WIEGAND CO. 422 First Ave. Pittsburgh, Pa.

## REGROUND BEARINGS



OUR REGRINDING PROPOSITION  
WILL CUT DOWN YOUR BALL  
BEARING BILLS. TRY US AND  
BE CONVINCED. SATISFACTION

GUARANTEED  
**AHLBERG BEARING COMPANY**  
317-327 EAST 28<sup>TH</sup> ST. CHICAGO, ILLINOIS.

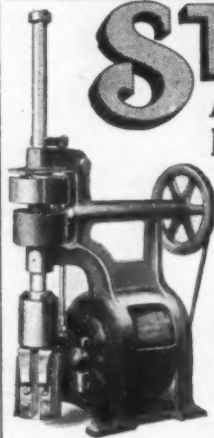
ATLANTA  
BOSTON  
CLEVELAND  
DETROIT  
KANSAS CITY  
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MINNEAPOLIS



NEW YORK  
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PITTSBURGH  
PORTLAND, ORE.  
PROVIDENCE  
SAN FRANCISCO  
ST. LOUIS - CHICAGO

## STORM

Automatic Cylinder  
Finishing Machines



Are speedy and accurate, self-centering and automatic. Produce a "gun-barrel" finish for close piston fitting. Ideal for grinding or honing after reaming or boring, or for refinishing alone where wear is slight.

STORM SELF-CENTERING FINISHING HEADS may be used with electric drill or drill press.

Write for new book on Modern Cylinder Methods.

**STORM MFG. CO.** Dept. A  
406 Sixth Ave., So. Minneapolis



## The Garage Special



Electric Drill and  
Valve Grinder

That saves every garage or repair shop time and money.

**Louisville Electric Mfg. Co.**

Incorporated

Louisville, Ky., U. S. A.

C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

It will do  
the work.

## MANLEY Wrecking Cranes



Manley Wrecking Cranes will handle wrecks of any description with one-third the labor, and in one-quarter to one-tenth the time required by any other method. They are independent of road conditions; mud, snow, ruts, deep sand and chuck holes do not affect them. They are 100% method of handling wrecks.

**MANLEY MFG. CO., YORK, PA.**

Will pull cars up banks, out of ditches, right them when turned over, etc. The greatest money maker for the Garage in existence. Hundreds of Garages have paid the cost of the Manley Crane the first week put into operation.

Send for catalog.

## New Era Bumpers Fit ALL Cars



The New "Duo-Convex" Bumper has graceful stream lines and convexity of spring bars. In black and nickel finish. Priced from \$12.00 to \$22.00 according to size and finish.



The New Duplex Sport Model. Most beautiful bumper on the market. Black japan or nickel. Medium cars, black, \$14.50, nickel \$18.50. Large cars, full nickel only, \$24.

Write for Catalog.

## New Era Spring & Specialty Co.

SMALLEY DANIELS, President

70 Cottage Grove St. Grand Rapids, Mich.  
Export Dept. 130 West 42nd St., New York City

You will find that many of the world's leading trucks and tractors are equipped with Waukesha High Torque Motors. Actual, every-day, ever-ready performance under any and all conditions have made the name

**Waukesha**  
TRADE MARK

the synonym of stability, satisfaction and uninterrupted service. A size to suit every requirement. Write.



**Waukesha Motor Co.**  
Waukesha, Wis.

Tip your coppers with Ruby as a flux for brass, steel, copper or galvanized iron, use Ruby full strength.



Free Trial Sample Sent  
At Your Request

**Rubyfluid**  
TRADE MARK REG.

Combination  
SOLDERING & TINNING FLUX

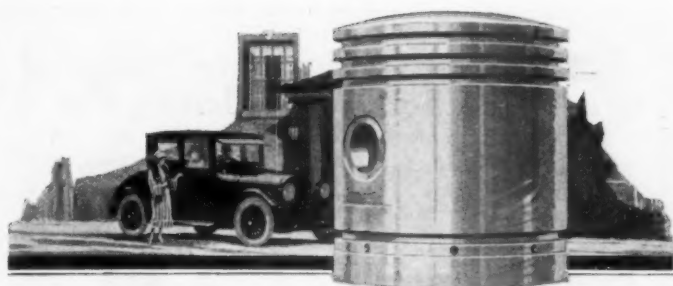
For  
All Metals

THE RUBY CHEMICAL COMPANY

68-70 McDowell St.

Columbus, Ohio





## Performance — Increased Demand Increased Production—Lower Prices

Many who have heard of the wonderful performance of "DOWMETAL" Pistons will be glad to get the news.

This metal, developed by special chemical process, may now be had at a lower price. Increased production is the reason.

Every change to "DOWMETAL" brings new evidence that its lightness, its toughness, and its smooth-running qualities mark it as the most notable improvement for modern motors.

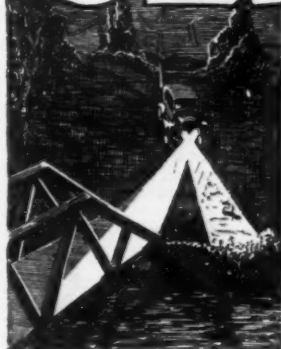
Racers and Touring Cars, Trucks and Busses, Speedboats and Planes have used "DOWMETAL" Pistons in the severest tests a motor can know with the same answer—more smoothness—more power—all the speed one dares to use.

You take out the buzz and rattle and remove the drag and jerk when needless weight is removed from reciprocating parts.

Make your new car better or your old car faster and smoother than when new. Ask your garageman about "DOWMETAL"—what it is—what it does. Write for descriptive folder.

**The Dow Chemical Company**  
Midland, Michigan  
U. S. A.

## CEZ Headlight Makes Night Driving Safe



Night driving is dreaded by every motorist. A majority of the serious accidents occur at night. Blind culverts, unbanked curves, improperly guarded bridges, hills with sharp turns all afford danger to even the most careful driver unless his car is equipped with

### C. E. Z. Automatic Headlights

The best safety device for Ford. This wonderful appliance is solving the problems the spotlight was supposed to solve. The C. E. Z. Head-

light uses the standard lamps on the car and makes them completely meet the requirements for light and safety. Unlike the spotlight, it complies with the law in all states.

A Broad Diffused Light is insured by the fact that the left lamp throws its light in a line with the front wheels at all times. When the wheels turn the light turns. The right light remains stationary so the driver can see directly ahead.

CEZ Headlight has stood the test under all driving conditions. 30-day money back guarantee. It is easy to sell because it appeals at once to every motorist who drives at night. Fits any model Ford. Installed in thirty minutes. No special tools required. No holes to bore. Full instructions packed with each device. Retail at \$5.00.

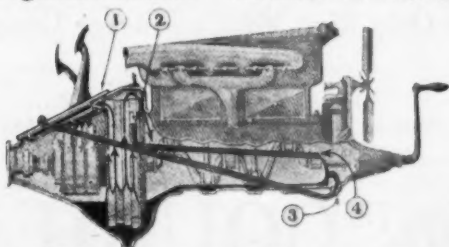
Manufactured, Guaranteed, and sold by

**ADMIRAL WELDING MACHINE CO.,**  
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*Liberal discount to Jobbers and Dealers*

## "Ford Faithful" Oiling System

(F & F Oiler)

The Best Insurance  
Against Motor Trouble in Fords



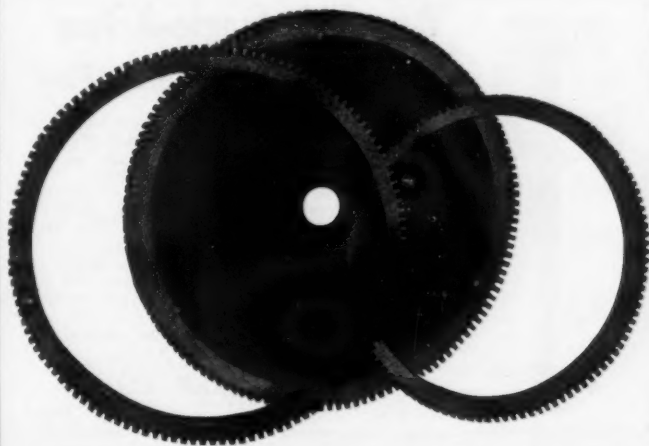
### Adds Years of Life to motor

Delivers an adequate supply of oil to motor *always*. Eliminates burnt-out bearings and scored cylinders. Gives greater oil mileage, strains oil, prevents carbon and lubricates transmission. Money-back guarantee.

DEALERS—The "FORD FAITHFUL" Oiler brings you (1) good customers and keeps them. (2) Good profits on a necessary article that has no competition—patents upheld.

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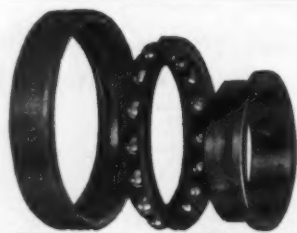
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Quantity production of highest quality fly wheel ring gears enables us to quote surprisingly low prices. Write for price list. Ten thousand in stock for immediate delivery.

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THRUST BALL BEARINGS, ANGULAR CONTACT THRUST BEARINGS and ANGULAR CONTACT RADIAL BEARINGS made to your requirements and dimensions. Star BALL RETAINERS for Thrust, Magneto and Cup and Cone Bearings.

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For fifty-one makes of cars and trucks in general use today, Walden-Worcester has fifty-one Service Selections of Socket Wrenches—each Selection especially designed for each particular nut on each particular car. Also Owner's Selections for you to sell, at a tidy profit.

Your jobber can supply you with any or all Selections from his stock. Write him.



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Incorporated

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For melting lead, babbitt, solder, zinc, etc. Pot holds 25 lbs. of metal. Torch used for heating soldering irons or any pre-heating work.

Has the Johnson Direct Jet Bunsen Burner with shut-off valve and pilot light.

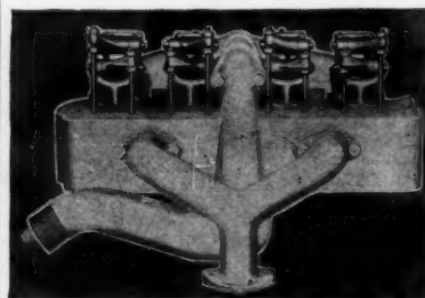
This Burner will produce a flame temperature of 2250° without the use of any forced air blast.

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Cedar Rapids IOWA



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Stupendous Power—  
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Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete—ready for installation—no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality—lowest prices. A postal card brings you complete list of our specialties.

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No. 1

## Why This Single-Acting Long-Barrel Pump Sells Fast

Car owners want a pump that will give them the desired air pressure with as little work as possible. And this is a decided point in favor of the Springfield No. 1 Single-Acting Tire Pump. No effort on the "up pull"—intake stroke. And on the downward—charging stroke, the motorist works in a natural position; reducing effort to a minimum.

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"The most completely and conveniently lubricated car in America."

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Over 1,500,000 in Use

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**TURNER QUALITY**

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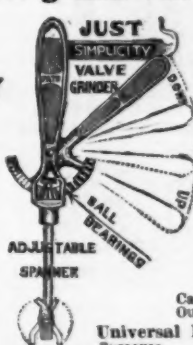
Axle Shafts	Spring Shackle Bolts
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*Buick Valve Lift Assembly with Guide  
for Passenger Cars and Trucks Sold Thru The Jobbers*

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**Just use a natural, easy pump action  
to grind valves**

**SIMPLICITY  
VALVE  
GRINDER**



Price  
**\$2.50**

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**Best For Automotive Work**

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**ALUMINUM ALLOY NON EXPANDING**



**How to Eliminate Piston Slap**  
Piston Slap is a common and vexatious cause of engine trouble which in the past has bothered most car owners. But it can now be eliminated. With the E. C. L. Aluminum Alloy Non-Expanding Piston, E. C. L. Pistons may be fitted with a closer degree of clearance than cast iron pistons. They reduce the consumption of gas and oil — increase power and speed and eliminate spark knocks. Let us tell you more about this remarkable piston. Write for the details today.

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Kokomo Long Life tires and tubes make money for dealers who handle them.  
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**Oversizes** **Standards** **Specials**  
Prompt shipment, highest grade materials, precision accuracy to closest dimensions and unexcelled workmanship. Send for specification and price lists—they make pin and valve buying simple.  
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Keystone Expansion Piston Pin Aligning Reamers  
Ask for 1922 Reamer Bulletin  
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**BLACK & DECKER**  
Portable Electric Tools  
"With the Pistol Grip and Trigger Switch"  
**The BLACK & DECKER MFG. CO.**  
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R & R Automatic Grease Retainers make it impossible for grease to leak out of Ford and 490 Chevrolet housings.  
No Special Tools Required to Install  
Formerly retailed at \$1.25 each, now reduced to \$1 a Wheel or \$2 for set of 2. Write today for dealers' discount.  
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"Once an Owner, Always a Friend"  
The complete Auburn line of 1923 including the Smaller Six provides a most attractive business opportunity for the dealer.  
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Main Office and Works: Springfield, Mass.  
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DRIVEN LIKE A SPEEDOMETER  
Distinctive in Appearance.  
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**Williams Accelerator**  
for FORD CARS  
Comfortable to operate.  
The pedal may be swung to any position desired.  
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Double check. Pay only for the gas you get. Makes satisfied customers. Write for catalogue.  
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PISTON RINGS

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Write for particulars

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Quicker—Safer—More Profitable

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When you find Ames dial gauges in the finest automotive shops, on close limit work — there's a reason. Let us tell you why. Write TODAY.

B. C. AMES COMPANY  
Waltham, Mass.**KISSEL**

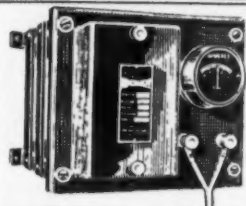
The Custom Built Car

The Aristocrats  
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7 Models—Open and Closed

Distributors in principal cities

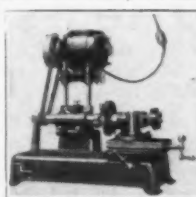
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The Correct Measure Motor Oil Display Pump will increase your oil business. Handsome. Compels attention. Delivers 1/2 gallon in 12 seconds. Can be put on curb in morning—and back indoors at night. \$45 per unit. Write for details concerning this money maker.

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NEW YORK OFFICE:  
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Won't Leak Because They're Sealed With Oil

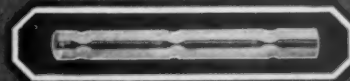
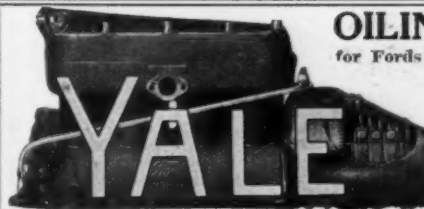


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Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

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ONLY  
HEATSAMPLE  
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JOBBERs are offered an opportunity to cash in on a strong advertising and sales campaign on a necessity Ford-owners are glad to buy. Ask for particulars.

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Successor to

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More than a Shock Absorber because it fluid-cushions all movements between the body and the chassis—gives a new experience in riding comfort.  
Good distribution territory is still to be allotted. For information write to  
**AUTO SPRING CONTROL CO.**  
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Manufacturers of Automotive Equipment, Drills, Punches, Shears, Shrinkers, Countershafts, Grinders, Buffers, Forges, Blowers, Tapers Irons and Blast Gates.  
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PISTONS  
WEIGH LIGHTEST · FIT TIGHTEST  
Regrinders, Repair Men, Dealers  
Write for literature, price list and liberal proposition. Prompt service and delivery on all standard and special oversizes up to .065. Over 600 models.  
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A better, quicker, engine-operated tire pump that sells for less. A great dealer opportunity. Write for details today.  
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Like a Pocket in a Shirt  
Has many uses. Drain crankcases, test tubes, scrub parts, carry tools. Keep parts, throw scrap in it. One piece of heavy gauge galvanized steel. Won't tip over. List price \$2.50. West of Rockies \$3.00.  
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IT'S FLEXIBLE  
Individually Cast, Heat Treated and Scientifically Correct.  
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**CARTER OIL GAUGES**  
For Ford, Chevrolet and Dodge—Only \$3.75  
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ACCURATE—EASY TO INSTALL—GUARANTEED  
Screw gauge to dash or instrument board; connect copper tube with elbow in place of lower petcock. No oil passes thru tube or gauge. No moving parts, floats or plungers. Easy to sell; easy to install. Big money-makers.  
Order from your jobber or write for discounts.  
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Cut-Outs  
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Excel in merit. You profit by knowing them. Ask us!!!  
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GET ACQUAINTED WITH  
**GASKO CEMENT**  
It's Better Than Shellac for Motor Gaskets  
Send 25c in stamps for Trial Tube—Today.  
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**Make \$150 to \$300 MONTHLY CHARGING BATTERIES**  
Get in this big money-making business NOW! \$20 Brings you an HB battery charger. Long easy monthly terms on balance. Sizes for 8, 10, 16 or 23 batteries. Write for information on size you need. Ask about HB Air Compressors, Motor Grinders, Tire Buffers, Ball Bearing Motors, Lighting Generators. Also HB Constant Potential outfit, to give 8-hour charging service. Sold on easy payments with money-back guarantee. **HOBERT BROS. CO.,** Box AR 72, Troy, Ohio.



**WHY PULL THE MOTOR?**  
The C. A. ADJUSTABLE CENTER BEARING CAP Corrects end-play in FORD crankshaft and sets magneto to give full efficiency, without removing the motor from the car. Installed in a few minutes and GUARANTEED TO WEAR FOR ONE YEAR. Retail price, \$3.75. If your jobber or dealer cannot supply you, write us. Address Dept. M.  
**ADJUSTABLE BEARING COMPANY**  
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Relio, an electric-drive wet grinder for pistons, pins, valves, bushings \$575.  
Valvo, an electric-drive bench grinder for valves, valve-seat reamers \$175. See page ads this paper.  
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ALL THE NAME IMPLIES  
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**Wayne**

No. 452  
Variable Gas Pump

**EARL THE VALUE of TODAY**

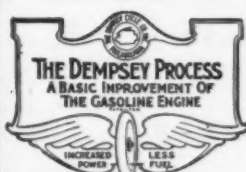
**MOTOR CAR** EARL MOTORS, INC.  
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**MOTOR DRIVEN CHAIN HOIST**  
LIGHT—PORTABLE—STRONG

Can be hooked up and plugged in anywhere. And where electric current is not available, the hand chain can be quickly applied—and the hoist operated as an ordinary chain block. Saves men, money and time. Learn the interesting details.

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A BASIC IMPROVEMENT OF THE GASOLINE ENGINE

The Dempsey Process—endorsed by leading automotive authorities—gives you a better and more profitable hold on the business in your town.

Learn about the Dempsey Cycle.  
Details on request.

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**Equip Your Shop**  
with  
**HOYT Electrical Testing Instruments**  
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Auxiliary firing-chamber gives it the explosive power of a howitzer. Carburetor must be adjusted LEANER immediately. Overcomes oil, self-cleaning. Retail \$1.

Distributors wanted.

**NT SPARK PLUG**  
With the Explosive Spark  
**THE T. N. T. SPARK PLUG CO.,**  
Cleveland, Ohio

**FEDDERS**

Radiator Cores for Replacement  
Can now be had


**FEDDERS MANUFACTURING CO.,** **BUFFALO, N. Y.**

Of the Same Genuine Fedders Quality  
which has made Fedders Radiators standard equipment on America's finest cars.

**51.6/10 MILES ON A GALLON OF GAS**

It is the official world's record-breaking test with Ford Touring car. The new 1922 Stromberg Carburetor and Hot Spot did it—made this marvelous mileage possible. Tens of thousands of Ford owners are now obtaining more miles on a gallon—quicker getaway—easier starting—increased power and speed—all because of having their cars so equipped. Live dealers are requested to write for facts pertaining to territory.

**Stromberg Motor Devices Co.**  
64 E. Twenty-Fifth St. Dept. 27 Chicago, Ill.



**Traf-i-kop**  
SIGNALS RIGHT, LEFT, GO OR STOP

**STOPS GUESSING**  
Indicates definitely direction driver intends to turn. Signals at both front and rear of open or closed cars. Meets requirements of all State laws. Attractive—Durable—Effective. Dealers—Jobbers, write for details and territory.

**The Motor Products Co.,**  
Norwalk, Ohio



**TRAINOR SPRINGS**  
Trade Mark

For All Cars and Trucks  
Write for Catalog and Prices  
**National Spring Co.**  
Newcastle, Ind.

**WICACO Twin Cut Piston Ring—**  
With the Wandering Oil Groove

[pronounced] **WICK-A-CO**

**WICACO**  
SCREW & MACHINE WORKS, INC., 4801 Stenton Ave., Phila., Pa.



just enough oil



**RED GIANT RIM TOOL**

As we have reduced the price on Red Giant Rim Tools to \$3.25 to dealers, you cannot afford to let this opportunity pass to get a real rim tool at a cheap price.

Sold in every state in the Union, Canada, Mexico, Holland, Belgium, Denmark and the Hawaiian Islands. If your jobber cannot supply you, do not take something "just as good," but order direct.

**RED GIANT TOOL CORP.**  
Lynchburg, Va.

Lifts 8 to 12 valve springs in thirty seconds, eliminates the necessity of removing valve springs.

**SPEED-O**  
MULTIPLE VALVE SPRING LIFTER

Write for descriptive data—and details of our special trade offer.

**Speed-O Multiple Valve Lifter Corp.**  
611 Amsterdam Avenue, New York City

(1950)

**Strom BEARINGS**

All types and sizes of radial (single and double row), thrust and angular contact bearings. Write us for further information.

**U. S. BALL BEARING MFG. CO.**  
4551 Palmer St. (Conrad Patent Licensee) Chicago, Ill.



**The Bear Tractor**

Write today regarding unassigned territory, and ask for catalog and distributor's and dealer's proposition.

**Bear Tractors Inc.,** 5309 Park Place, New York City

*The Tractor that Delivers its Power to the Drawbar*

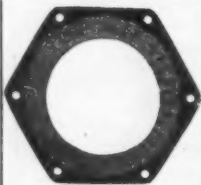
**BROWN-LIPE-GEAR**  
TRANSMISSIONS  
**BROWN-LIPE-CHAPIN**  
DIFFERENTIALS


THE GRAND PRIX CAR  
**DUESENBERG**  
*Original Straight Eight*  
Duesenberg Automobile & Motors Co., Inc., Indianapolis


**YAHOOOTA**  
Let your customers hear the  
Sparton speak!  
Special display heard given free with initial  
order for six. Write for complete particulars.  
The Sparks-Withington Co., Jackson, Michigan

Send Us Your Armature Repair Work  
**FORD**  
ARMATURES  
REWOUND  
\$2.00  
  
ALL WORK GUARANTEED—WRITE FOR PRICE LIST  
U. S. AUTO SUPPLY CO., 3845-49 S. WABASH AVE., CHICAGO

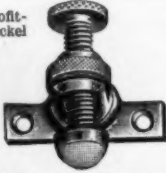

**Twin-Spring BUMPER**  
FOR FORDS  
A better bumper at a  
better price with  
Underwriters'  
Approval  
NEW YORK WIRE & SPRING CO.  
P. O. Box MA-43, Uptown Station. Hoboken, N. J.

  
**GUAY CLUTCH DISC & PLATE**  
For Dodge Bros. Cars  
Models for other cars will be announced shortly. Extraordinary flexibility and durability are gained by passing every thread of asbestos over and under the steel fingers at a given length of 1/4 inch. Thus all springs are under the same measured spring tension. Steel and asbestos only materials used. No wires or rivets to cause uneven wear. Price of complete set, \$12.00. Good discounts to trade. Write for complete details.  
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Mfg. Division 159 W. Illinois St., Chicago

  
**SOCKETS WILL NOT BREAK**  
This new socket wrench is something every mechanic has long wanted. Made from selected stock, specially heat-treated and hardened. No other sockets are quite so strong, no other ratchet quite so well made, no other universal quite the same. Care and quality is evident in every unit. Exceptional facilities allows marketing at an attractive price. Write for guarantee.  
**THE EASTERN MACHINE SCREW CORPORATION**  
10-20 Barclay St., New Haven, Conn.

  
**MONOGRAM**  
The  
Self Locking Radiator Cap


**ALVORD QUALITY TOOLS**  
  
Taps, Dies, Cutters, Drills, Reamers  
Send for Catalog  
**ALVORD REAMER & TOOL COMPANY**  
Millersburg, Pa.



**JOBBER'S**  
Do not overlook these live selling and profitable items. The metal is brass, heavy nickel plated and will not rust.  
Four styles—one for every car.  
No. 503 with the Hump Base.  
No. 504 with Ell Base. No. 505 Plain Lock-Type. No. 506 Swivel Lock-Type.  
Packed fifty to carton; five display cards of ten each.  
The company that took the rattle out of Anti-Rattlers  
  
**THE AUTOQUIP MFG. CO., Inc.** 495 St. Paul St., Rochester, N. Y.

**PERFECTION**  
Silent Timing  
**GEARS**  
PERFECTION GEAR COMPANY  
1475 Michigan Ave. CHICAGO  
SILENT DURABLE DEPENDABLE  
WORLD'S STANDARD REPLACEMENT

**EVERYDAY—the Only Ring That Is Absolutely Locked**  
The EVERYDAY Master Lock locks the piston ring Edgewise—Widthwise—Lengthwise, just like a solid ring. You can't force gas—oil—power past the joint.  
Write now for the Xtra Profit Plan on EVERYDAY Piston Rings.  
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**GTD** Taps • Dies • Drills • Reamers • Gages  
Machine Tools Screw Plates  
Milling Cutters *Little Giant* Pipe Wrenches  
  
**GREENFIELD TAP AND DIE CORPORATION**  
GREENFIELD, MASSACHUSETTS

  
**Martin Auto-Hoists**  
See our full-page announcements in the December 13th and 27th issues of Motor World and the December 28th issue of Motor Age.  
**THE T. A. MARTIN EQUIPMENT CO., Inc.**  
Bridgeport, Conn.

  
PRICE \$1.50 ONLY  
"Bull Dog" Foot Accelerators for Fords  
A live article—in demand because it always makes good.  
**RUBBER COVERED PEDAL MAT BINDER NON-SLIP FOOT REST**  
  
**The W. H. Thomas Mfg. Co.**  
Spencer, Iowa  
Sales Representatives  
The Fulton Co., Milwaukee, Wis.

**BOWSER**  
ESTABLISHED 1885  
ACCURATE MEASURING PUMPS  
**S. F. Bowser & Co., Inc.** Home Plant, Fort Wayne, Indiana

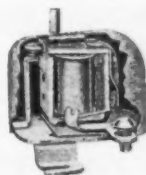




## INLAND COMPLETE PISTON SERVICE

A ring for every purpose—Spiral Cut, Oilless and StepSet—and a complete line of semi-steel Replacement Pistons and high-grade Piston Pins. Write for details.

INLAND PRODUCTS CO., INC.  
Main Office and Factory St. Louis, U. S. A.



## The G L B Protector

Saves your battery, your lights and your generator.  
And it shows at a glance any defects in your charging line, cutout and ammeter.

Our literature gives the details.  
LUPTON, HILL AND LUPTON,  
Dayton, Ohio

## U. S. ASBESTOS Also Durabestos & Motobestos BRAKE LINING

Unequalled in its Performance

Write us  
United States Asbestos Co. Manheim, Pa.

Send  
for  
Catalog

## TESTING EQUIPMENT FOR ELECTRICAL SERVICE STATIONS

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244 W. 49th St. New York City



## Tasco Visible Gas Gauge For Fords

Tells instantly supply of gas. Simply insert instead of regular gas cap. Retail for \$1.00. Every Ford owner wants one. Order from jobber or direct.

LIBERAL DISCOUNT  
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This car is built primarily for the man who can own a good car but who loves to drive and care for it himself. Photographs will be mailed to interested dealers.

TARKINGTON MOTOR CAR CO.,  
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## UNIVERSAL HOSE CLAMP

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

UNIVERSAL INDUSTRIAL CORP. Hackensack, N. J.

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FOR FORD CARS

Makes riding and driving a pleasure. Eliminates road shocks and hard steering, spring breakage, shock absorbers. Write for our money making dealer proposition.  
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## FOR AUTOMOTIVE SERVICE

**PETERS**  
PRODUCTS

Crankshaft Grinder  
Universal Bearing Reamer  
Connecting Rod Bearing Reamers  
Metallic Filler  
Aluminum Brazing Solder

Our engineering department will be glad to help you with your repair problems. ASK!!

PETERS ENGINEERING CO.  
33rd St. and Woodland Ave. Philadelphia, Pa.

As people say everywhere

## United States Tires are Good Tires

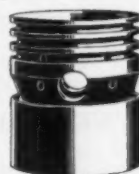
No Springs  
No Auto-  
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attachments  
No adjust-  
ments.

**Omac**  
constant-unit

CARBURETOR

6 TO 12 CARBURETORS IN ONE  
Jennings Corporation, Homewood Station, Pittsburgh, Pa.

Simple  
Positive  
mechanical  
action.



## DOUBLE SEAL OIL-CONTROL-PISTON

This hook-shaped groove catches the excess oil and returns it to the crankcase through holes in the bottom of the groove. Oil troubles are unknown with this piston. Used by many car builders as standard equipment. Write for our dealer proposition.

Double Seal Ring Company  
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Cylinder — Internal — Surface  
Grinders — Magnetic Chucks

THE HEALD MACHINE COMPANY

61 New Bond St., Worcester, Mass. Branches in Various Cities

## Gill-Special-Servus

Piston Rings for Every Need

GILL MFG. CO., 8300 South Chicago Ave., Chicago

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SPEED  
UP



OVER 50 WONDERFUL SHORT CUTS  
IN NEW CATALOG T-105

ASK FOR IT

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\$2.50

**WEBSTER**  
MAGNET LIGHT

—STICKS WHERE STUCK

WEBSTER ELECTRIC COMPANY  
RACINE, WISCONSIN, U. S. A.



The old original, non-drying, non-freezing, ready  
Water-Mixed

Valve Grinding Compound  
Does a better job in half the time.

PEP MFG. CO., INC.  
33 West 42nd Street, New York, N. Y.

## The NATIONAL COLLAPSIBLE RIM

"On and Off in 30 Seconds"

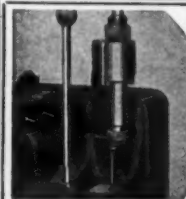
NATIONAL COLLAPSIBLE RIM CORP.  
Knickerbocker Bldg., 42nd St. and Broadway, New York City

## COLEMAN Quick-Fill Tire Pump

"More Air with less Strokes"

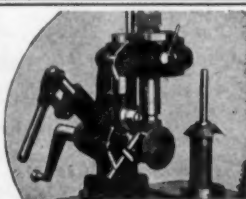
Write for Prices

The Coleman Lamp Co., Wichita, Kans.



### The SPRITE

Doubles Your Profits  
Grinds All Valves and  
Valve Seats with an  
Emery-Wheel; Reaming  
Unnecessary; Cuts the  
Time in Half. Motor  
runs 15,000 r.p.m. Write  
for Free plan for making  
more money on valve  
work. Circular.  
The Throm & Davis Co.  
Toledo, Ohio



## UNIVERSAL BATTERIES

with the hard,  
long life, plates

Write for proposition. Your territory  
may be open.

Universal Battery Co., 3422 So. LaSalle St.  
CHICAGO



(142)



## POMEROY GASAFIERS AT COST

in unoccupied territory  
MR. DEALER: We want YOU to profit the same as  
1000 other dealers have in selling the

## POMEROY PATENTED GASAFIER

SUMMER VALUE ALSO.—Just ask on your letterhead  
for our "Get Acquainted" offer—ONE UNIT AT COST  
FOR YOUR PERSONAL USE. References: Any Roches-  
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the service value of PRIME WITH HEAT.

POMEROY ELECTRIC CO., Inc., Mfrs., 44 E. Main Street, Rochester, New York



Garage Tools  
Ask your Jobber.

Albertson & Co., Manufacturers, Sioux City, Iowa

Standard tools for fast, ac-  
curate work in refacing,  
reseating and grinding  
any and all size valves,  
also Flexible Shaft At-  
tachment.

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CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS

## THE CLEARING HOUSE OF THE MOTOR INDUSTRY

FOR PARTS, ACCESSORIES, TIRES, MACHINERY REBUILDING, REPAIRING, WELDING AND USED  
CARS. ALSO HELP AND SITUATIONS WANTED AND MISCELLANEOUS CLASSIFIED ADVERTISING

Parts and Repairs

Parts and Repairs

Parts and Repairs

## New GEARS & SHAFTS

for  
TRANSMISSION AND AXLE  
SILENT TIMING GEARS  
FLY-WHEEL STARTER GEARS  
All Shipments Made Same Day  
GUARANTEED GEAR  
SERVICE COMPANY

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## WE'VE GOT EVERYTHING

—In the line of New and Used Auto Parts,  
Accessories and Supplies, for all makes and  
models of cars.

Engines; Transmissions; Clutches; Axles;  
Wheels; Rims; Tires; Radiators; Gears; Axle  
Shafts; Bearings; Magneto; Starters; Gen-  
erators; Coils; Batteries; etc., etc.

Ours is the largest stock of its kind in the world.  
You will save time and money by getting in  
touch with us first whenever you are in need of  
anything in this line.

## WARSHAWSKY & COMPANY

World's Largest Car Wreckers and Replacement Parts  
House.

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No Branches Ph. Calumet 7315 No Branches

## PARTS

NEW AND USED  
for all makes of cars

QUICK SERVICE

AND

RIGHT PRICES

WRITE—WIRE—OR COME TO  
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CEDAR RAPIDS, IOWA

## SAVE 50 to 75 Per Cent on Reclaimed Auto Parts

The Original "We Tear 'Em Up and Sell the Pieces"  
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If you have stocks of parts, accessories, or supplies for immediate disposal, the logical  
place to get in touch with your buyers is this Classified Advertising Section.

Classified Advertising Department

MOTOR AGE

Chicago, Illinois



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New  
Auto & Truck **PARTS**Save Money by Dealing Direct  
with **Factory Distributors**

Genuine and replacement parts for all makes and models. Differential and Transmission Gears, Silent Timing Gears, Russell Truck Axle Parts, Parts for all types of Torbenson Axles, Axle Shafts, Drive Shafts, Pistons, Pins, Springs, etc.

FREE CATALOG

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1520 Grand Ave. Kansas City, Mo.Tires  
Rebuilding and Repairing  
Magneto and Service Stations  
Miscellaneous**DEALERS AND SALESMEN**

Get our rock bottom prices and our exclusive territorial rights on

**TIRES AND TUBES****THE ARMSTRONG TIRE CO.**  
1300 S. Wabash Avenue, Chicago, Ill.Patents and Patent Attorneys  
Miscellaneous  
Help Wanted  
Situations Wanted**Attorney-at-Law and Solicitor of Patents****C. L. PARKER**

Formerly Member Examining Corps., United States Patent Office

American and foreign Patents secured. Searches made to determine patentability and validity. Patent suits conducted. Pamphlet of instruction sent upon request.  
McGill Building, WASHINGTON, D. C.All Phones:  
West 4918**LAMMERT & MANN CO.**

ESTABLISHED 1894

215-21 N. Wood St.  
CHICAGO**EXPERT CYLINDER AND CRANKSHAFT RE-GRINDING****SPECIAL LIGHT WEIGHT  
CAST IRON PISTONS****PISTONS—RINGS—WRIST PINS  
SCORED CYLINDERS REPAIRED****AUTO Save 50 — 90%  
2000 Models PARTS**

NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

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321 Windsor Ave. HARTFORD, CONN.**Are You Interested  
in Regrinding  
Cylinders?**

The Heald Machine Company build a machine expressly for this work. Simple, self-contained, large capacity, and sold at a moderate price.

Regrinding is ideal for small machine shops, auto repair shops and welding concerns.

Let us send you a survey of what others are doing in this business.

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61 New Bond St.

Worcester,

Mass.

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PROMPTNESS ASSURED BEST RESULTS

Send drawing or model for examination and report as to patentability

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624 F Street N. W., Washington, D. C.**Garage for Sale**

75x125 brick front, stuccoed tile walls, steel beams with a well equipped shop. Agency for Buick and Dodge cars. Located in Osceola, Wis., in a good farming community.

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5 So. Wabash Avenue, Chicago, IllinoisNew and Used **PARTS** for All Cars

Save 25 to 75%

**AUTO SALVAGE & PARTS CO.**  
Oklahoma City, Okla., U. S. A.**AUTO PARTS**

Nearly 3,000,000 Auto Parts.

Why buy new parts, when we can

**SAVE YOU 50% to 75% off list?**Parts for all models, Maxwell, Overland, Studebaker, from 1910 to 1920, and others.  
**EUREKA AUTO PARTS & TIRE COMPANY**  
334 N. Capitol Ave. and 503 N. Illinois St.  
Indianapolis Indiana**PARTS****FOR NEARLY ANY MAKE OF CAR**

At 25 to 75% Off List Price

Satisfaction guaranteed or money refunded

**I. WOLF AUTO PARTS & TIRE CO.**  
"A Million Parts"  
619 N. Illinois St. Indianapolis, Ind.**WICHITA AUTO WRECKING CO.**

"The Old Reliable"

Offers you quick service, quality parts and absolute satisfaction,—and our prices are a little lower. We are an old reliable house and all that implies. Our stock of parts is one of the largest in the country—from a 1907 one cyl. Reo to a 1921 Overland Four.

**Wichita GIVE US YOUR NEXT ORDER** Kansas**NEW PARTS FOR ALL CARS**

Axle Shafts, Bearings, Gears, Universal Joints, Starting Motors, Lighting Generators, Coils, Magneto, Wheels, Rims, Springs, etc.

Dealers Write for Special Bulletin

**PURITAN MACHINE CO.**  
DETROIT, MICH.**Notice to Auto Parts Dealers**

Chandler ring gears and pinion gears, 53-12 spiral, fits all models 1916 to 1921. Brand new A-1 guaranteed gears.

Write for prices

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No. 21 E. 8th St., Cincinnati, Ohio**ALUMINITE PISTONS and  
Connecting rods for all  
make cars****FORD SPEED SPECIALTIES**  
Special **ALUMINITE** racing  
pistons for Ford motor  
(12 oz.)**HIGH SPEED CAMSHAFTS**  
**POWER-PLUS** cylinder head  
for Ford cars**IRON REPLACEMENT  
PISTONS****Green Engineering Co.**  
DAYTON, OHIO**STARTERS GENERATORS  
ARMATURES**Send them to **KANSAS CITY****FORD GEN. ARMATURE, \$2.50****STARTER SERVICE ENG. CO.**

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**Salesmen****"Wonderlamp"**

It's a big and quick seller. An Electro

Magnetic Trouble

**LIGHT FOR MOTORIST**Dealers and Garagemen write for circulars. Liberal commission to salesmen acquainted with the trade.  
**WONDERLAMP CO.**  
497 Houatons Ave., Bridgeport, Conn.**WANTED:**

Sales Representative to call on the Hardware, Garage, Motor Supply, Tire and Car Agency Dealers to sell Automobile Seat Covers, Tire Covers and Top Covers. Advise what territory you are covering and how often. Also state references.

**Address Box E-6043, Care Motor Age**  
5 So. Wabash Avenue Chicago, Illinois**AUTO INDUSTRY MAILING LISTS**

Send to headquarters for dependable lists of Automobile Owners, Dealers, Accessories, Garages, Tire and Battery Stations, Truck Fleet Owners, Bus Lines, Taxi-cab Companies. Write for catalog and prices.

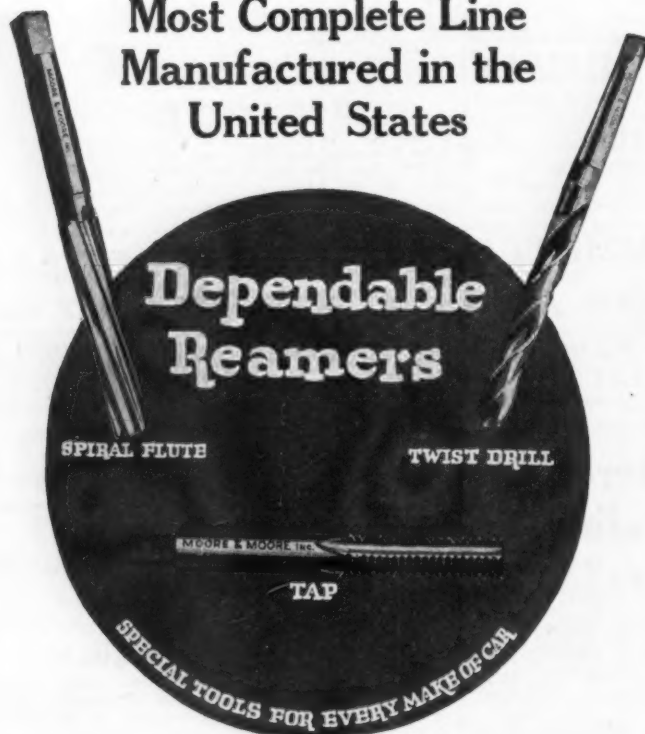
**MOTOR LIST COMPANY****Fourth & Grand 431 Howard St.**  
Des Moines, Iowa Detroit, Mich.**HERE IS A MAN**

with wide experience in motor truck operation and maintenance. Now handling garage and maintenance for a middle west fleet owner operating more than 225 trucks, but desires connection with broad opportunity in some other section of country with milder climate.

Has 19 years' acquaintance with transportation problems, and the operation and maintenance of motor vehicles. What have you to offer?

**Address Superintendent,**  
**Box E-6039, Care Motor Age**  
5 So. Wabash Ave. Chicago, Ill.**Hard Job Wanted**—13 years at all sorts of auto repairing has fitted me to take charge of service for some busy dealer or repairman. Married, punctual, resourceful, cheerful. All references. Location and working conditions secondary to comfortable pay that will be raised out of the additional profit I get for my boss. **W. Vlek, 3855 W. Washington Blvd., Chicago, Ill.****HIGH GRADE SERVICE MANAGER**  
Desires position. 16 years' experience. Married. Can handle men and produce results. References furnished.  
**Address Box E-6045, care MOTOR AGE, 5 S. Wabash Ave., Chicago, Ill.**

Most Complete Line  
Manufactured in the  
United States



**Moore & Moore, Inc.**  
Reading, Pa.

**QUALITY**

**Springs**

Analyzed Steel  
Controlled Heat Treatment  
Careful Fitting

**AND EVERY SPRING  
THOROUGHLY TESTED**  
**AMERICAN AUTOPARTS COMPANY**

9775 French Road  
Detroit, Mich.

**AMERICAN Springs**

ANY CAR ANY MODEL ANY YEAR  
DISTRIBUTORS EVERYWHERE—WRITE FOR CATALOG

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## Secret of Its Triumph in New Locking Device

A windshield Cleaner that is winning wide favor because it embodies all the features of a good cleaner—plus a new locking device that makes for quick responsiveness, a firm, effective stroke, and long service.

## MALCO Universal Windshield Cleaner

Because it can be clamped on or bolted thru hole of windshield frame of any make or model of car, dealers are finding it profitable to standardize on MALCO. It reduces capital tied up in stocks and results in quick turnover.

Ask your Jobber's Salesman about the Malco Line of products or write us direct, sending name of your jobber.



**Malco Products Corporation**  
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## The Ultimate Way WET INTERNAL GRINDING

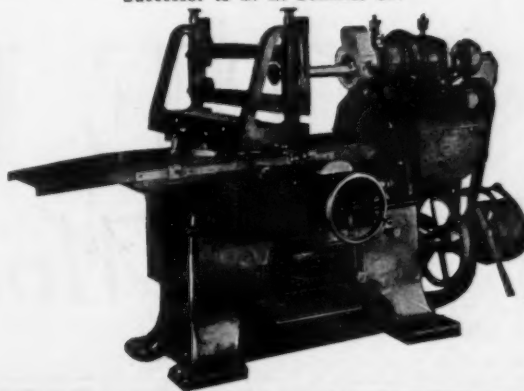
Wet grinding, as made possible by the Micro Internal Grinder, is as far in advance of ordinary dry grinding as the present day automobile is over the old ox team.



The Micro is a highly developed type of internal grinder adaptable for either wet or dry grinding, at the option of the operator, permitting highest quality of results. Its automatic action, both as to cut, feed and table travel provides the most accurate work humanly possible in exceptionally quick time.

If you're going to get a grinder, get the kind that will pay you bigger returns. Our bulletin gives full information—send for it.

**MICRO MACHINE COMPANY, Bettendorf, Iowa**  
Successor to B. L. Schmidt Co.





STEPHENS SPORT TYPE "FOURSOME," WITH DISC WHEELS, \$1985; WITH WIRE WHEELS, \$2085

## Stephens "*Foursome*" strikes high note in Sport models at \$1985

A patrician among sport models, the new Stephens "Foursome" will attract every motor enthusiast in your city when it goes on your selling floor.

Brilliant in performance, alluring in color and form, it unites ease of control, flexible power and instant pick-up with a balance, a low center of gravity and freedom from vibration that make mile-a-minute speeds safe.

Its fawn gray body contrasts boldly with black fenders and aprons. Radiator, head and cowl lamps and windshield standards are polished nickel.

Apple green wheels, clear-horizon top of mellow khaki with hickory bows. Hand buffed black leather upholstery.

Three-quarter running board with aluminum kick plates, two locked compartments and tonneau clock on the back of front seat. Notable equipment includes windshield wings, bumper, motor thermometer on dash, Kellogg power tire pump, toilet kit and trunk.

Six other great "high-spot" cars in the new Stephens line. See them *soon*: drive them. Write or wire Moline for color catalogue and contract terms *today*.

STEPHENS MOTOR CAR COMPANY, INC., *Moline and Freeport, Ill.*

TOURING CAR, 5-PASS., \$1295

TOURING SEDAN, 5-PASS., \$1595

SEDAN, 5-PASS., \$1895

ROADSTER, 2-3-PASS., \$1345

TOURING CAR, 7-PASS., \$1685

SEDAN, 7-PASS., \$2385

SPORT "FOURSOME," 4-PASS., \$1985

ALL PRICES F. O. B. FREEPORT, ILL.

# STEPHENS

· Motor  Cars



# *Cole* Aero-EIGHT

## Gives Car Dealers the Year's Big Chance

**I**N every community in the United States there are hundreds of well-to-do people who know the merits of the Cole car and will be eager to buy it on the basis of our new sales plan.

These people are the backbone of their communities—the real buying power which every dealer who is a merchant **WANTS AND MUST RECKON WITH** if he hopes to see profit figures on his ledger.

We shall be glad to give you the complete details of the new Cole plan, if you ask us. It is a perfect solution of the used-car problem, and presents a **CERTIFIED** opportunity for the merchant who has the Cole franchise.

If your locality is not represented in our dealer organization, we advise most strongly that you get in touch with us immediately.

**COLE MOTOR CAR COMPANY**

Indianapolis, U. S. A.



*There's a Touch of Tomorrow in All Cole Does Today*



## Sell six lamps instead of one— like Leo Shaffer does



The first of the 1923 auto lamp kit advertisements—a full page, in two colors in the Saturday Evening Post for January 27. During February, advertisements will appear in Colliers, Red Book, Life, Farm and Fireside and Successful Farming.

Ask your jobber about our plan of dealer cooperation to help you sell six lamps instead of one.

LEO SHAFFER is manager of the East Orange (N.J.) Auto Supply Company, whose window is shown above. He said last month:

"Recently I have been keeping a record of the number of customers asking for auto lamps. Out of 52 customers, I sold the Edison MAZDA Lamp Kit (containing six lamps) to 24, or a total of 144 lamps. Thus I sold 120 additional lamps by the use of a kit. All I had to do in most cases was to show the kit and explain what it was for. I also find Edison MAZDA Lamps the easiest selling article on the shelf."

Mr. Shaffer's story is typical. Carry *dependable* Edison MAZDA Lamps and the handy kit, "ask 'em to buy," and you will sell six lamps instead of one. For particulars write your jobber today.

**"Carry a kit of spare lamps  
as you carry a spare tire"**

This message will be carried to the car drivers of the country practically every week of 1923 through Edison MAZDA Auto Lamp advertisements in six national magazines, reaching 5,000,000 homes of the car owning class.



# EDISON

## MAZDA LAMPS

A GENERAL ELECTRIC PRODUCT

